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SOFTWARE FOR INSEASON ASSESSMENT  
OF SALMON RUNS IN LOWER COOK INLET



By  
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Wes Bucher and Lee Hammarstrom put the software to the test during the 1991 and 1992 field season and recommended improvements in the output. Trish McNeil tested the step-by-step instructions in the help files during the 1992 and 1993 field season and suggested simplifications and improvements. Wes, Lee, and Trish all read this report to insure the accuracy of this manuscript.

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## ABSTRACT

A suite of custom FORTRAN computer programs and commercial software applications was assembled to provide fishery managers with real time, inseason summaries of Lower Cook Inlet catches and escapements for all species of Pacific salmon *Oncorhynchus*. The software also provide a forecast of total run size based on historical run timing curves developed for sockeye, pink and chum salmon. Camera-ready tables can be produced at the end of the season and inseason escapement data can be reformatted and imported into the existing historical database.

**KEY WORDS:** catch, data management, escapement, forecast, *Oncorhynchus*, run timing, salmon

## INTRODUCTION

Each summer, fishery managers in Lower Cook Inlet monitor the run strength of five species of Pacific salmon *Oncorhynchus* in order to manage the commercial catch from 41 harvest areas. To do so, they must keep track of escapements into 92 streams and lakes and have an idea of historical run timing. This report describes a mix of custom FORTRAN computer programs and commercial software applications that were assembled to provide fishery managers with a real time, inseason synopsis of the most recent daily and cumulative catch and escapement data, a summary of historical run timing, and a forecast of total run size. Selected outputs from the computer programs were designed to be camera-ready tables for end-of-the-season reports. Escapement data files were also designed to be imported into an historical database.

## DESCRIPTION OF SOFTWARE

Figure 1 illustrates while Appendix A narrates the flow of data and software required to produce a run status report. Interactive menus (Figure 2) and access to the on-line help files (Appendices A-K) are provided by commercial software (IBM's Fixed Disk Organizer, Ver. 1.0). Final output is sorted by harvest area and management district according to the sequence of stream and harvest area codes in a file named CODES.LCI (Table 1).

### *Catch*

Inseason run summaries rely on oral (preliminary) catch reports, which are available immediately after each fishery closure from fish buyers and processors. This data is entered directly into a disk file using a text editor. The file is named 199Y.DAT where 199Y is the year of the catch( e.g. 1992; see Appendix B for oral report instructions).

The file named 199Y.DAT can also be the input file for a set of harvest reporting programs written by Fred Jameson (Alaska Department of Fish and Game (ADFG), Anchorage). However, harvest or dummy weights must be added to this file and the file must be renamed 199YC.DAT. Fred Jamsen's harvest reporting programs provide additional information on the catch such as gear type and mean weights.

Preliminary oral catch data are replaced with final catch data, when fish tickets are sent in by fish processors and buyers a week or two after the fishery. Final catch data are entered into the *Fish Ticket* system, an established stand-alone suite of harvest-record software developed by the ADF&G Computer Services staff. To extract catch date, abundance, and location data from the *Fish Ticket* system, the user writes a *Fish Ticket* output file named SPECIES.LST (see Appendix B for *Fish Ticket* instructions and Figure 3 for an example of SPECIES.LST). SPECIES.LST

contains tab characters which must be removed before the next step. A text editor named KEDIT can be used to replace the tab characters with blanks (see Appendix C for detailed instructions). After tab characters are replaced with blanks, the user runs a FORTRAN program named EXTRACT.EXE to read SPECIES.LST and write a file named T1 which contains harvest area codes, dates and number of salmon caught, by species, without report titles and column headings (Figure 4, see Appendix D for detailed instructions). Information about the fisher, buyer, and catch contained in the *Fish Ticket* system are not used by the run status programs.

To combine the data in the files 199Y.DAT and T1, the user runs a FORTRAN program named MERGE.EXE which writes data from both files to a new file named CATCH (Figure 5, see Appendix E detailed for instructions). If data for the same date and harvest area exists in both files, only the *Fish Ticket* data is written to CATCH. CATCH is used as an input file for the run status program named UPDATE.EXE (see section titled Total Run Estimates).

### *Escapement*

There are three methods of estimating escapement: weir counts, aerial surveys and ground surveys. Data entry for all three methods was simplified by using three LOTUS spreadsheets named AERIAL.WK1, WEIR.WK1, and GROUND.WK1 (see Appendix F for detailed instructions). Separate spreadsheets were used because each of the three types of surveys are conducted by different staff members. Data in these spreadsheets are written to ASCII files named AERIAL.PRN, WEIR.PRN, and GROUND.PRN (Figures 6, 7, and 8; see Appendix G for detailed instructions). Column headings from the spreadsheets are retained in AERIAL.PRN and GROUND.PRN but are not used by other programs.

Aerial and ground survey data are converted to escapement estimates with FORTRAN programs named GROUND.EXE and AERIAL.EXE, respectively (see Appendices H and I for detailed instructions). These programs estimate accumulated sockeye salmon escapement from the peak aerial survey. Accumulated pink and chum salmon escapements, on the other hand, are estimated from

$$pink \text{ or } chum \text{ escapement} = \frac{\sum_{i=1}^n \frac{(x_i + x_{i-1})}{2} (d_i - d_{i-1})}{17.5}, \quad (1)$$

where  $n$  = number of surveys,  $d_i$  = Julian calendar date of survey  $i$ , and  $x_i$  = number of live pink or chum salmon observed in the study stream during survey  $i$ . Since pink and chum salmon do not arrive in the streams before 10 July,  $d_0$  = Julian date 191 and  $x_0$  = 0. Dividing the numerator, which accounts for the number of days between surveys, by 17.5 day stream life, yields pink and chum salmon escapement accumulated through the last survey. The computer

program will use as the escapement estimate the greater of the peak live count, the peak live plus carcass count, or the stream life estimate.

The primary output from AERIAL.EXE is a file named AERIAL (Figure 9), which is used as an input file for the program named UPDATE.EXE (see section titled Total Run Estimates). A second file named AERIAL.ESC is also written to document the specific method used to estimate escapement (Figure 10).

The primary output from GROUND.EXE is a file named GROUND (Figure 11), which is used as an input file for UPDATE.EXE (see section titled Total Run Estimates). Two other files are also written. The file named GROUND.ESC documents the methods used to estimate escapement (Figure 12). The file named STREAM.TAB is a daily survey summary sorted by tide zone and species (Figure 13).

Weir counts are considered as actual escapement counts and, therefore, do not require conversions.

#### *Total Run Estimate*

The FORTRAN program named UPDATE.EXE is used to combine catch with escapement estimates into total run estimates (see Appendix J for detailed instructions). This program compares aerial and ground survey estimates and selects the greater value as the estimate of escapement for each species and system. Eight files are used for input data: the catch file named CATCH, the three escapement files named AERIAL, GROUND, WEIR.PRN, and four historical run time data files for sockeye, pink, chum and coho salmon (Figure 14; Yuen 1993). This program offers two output options: inseason and postseason.

The inseason option consists of two run status reports. The first provides a synopsis of catch, ground and aerial surveys, and the current run size for all salmon stocks by harvest area (Figure 15). The second gives the expected proportion of the total run based on historical data for the most recent catch or escapement date and presents a forecast of total run for the season based on these proportions (Figure 16). The postseason option writes a camera-ready table for reports and does not provide a forecast or list the most recent data (Figure 17).

#### *Historical Escapement Database*

At the end of the year, aerial and ground survey data are stored in *Rbase* (commercially software). The FORTRAN program named CONVRBAS.EXE is used to read the files AERIAL and GROUND and to write a file (Figure 18) that can be imported into the *Rbase* historical escapement database (see Appendix K for detailed instructions). The *Rbase* escapement data base application was also written by Fred Jameson (Alaska Department of Fish and Game

(ADF&G), Anchorage). The program CONVRBAS.EXE sorts the data by management area, i.e. Southern, Outer, Eastern, and Kamishak, as required by the *Rbase* salmon escapement database.

## HELP FILES AND DISCUSSION

The following on-line help files with step-by-step instructions are available: TOTALRUN.HLP, CATCH.HLP, EXPAND.HLP, EXTRACT.HLP, MERGE.HLP, ESCDATA.HLP, 123PRN.HLP, AERIAL.HLP, GROUND.HLP, UPDATE.HLP, and CONVRBAS.HLP (Appendices A-K).

The order in which harvest areas appear on the reports is determined by the order in which stream codes are listed in the file CODES.LCI (Table 1). The manner in which escapement streams are matched with harvest areas is also determined by this file. If the escapement into a stream is matched incorrectly with a harvest area, check the data in CODES.LCI. Some fisheries target on runs to a single stream (e.g. McNeil River chum salmon fishery, Mikfik creek sockeye salmon fishery) while others harvest runs to two or more streams (e.g. Windy Bay pink salmon fishery, East Arm Nuka Bay sockeye salmon fishery). Any spelling corrections should also be made in this file.

The assignment of a harvest area to a particular management district is written as part of the source code for UPDATE.EXE. Presently, UPDATE.EXE assigns harvest areas 1-12 to the Southern District, 13-26 to the Outer District, 27-30 to the Eastern District, and 31-41 to the Kamishak Bay District. If any of these assignments have to be changed, find the control breaks (i.e. the instruction to the computer to complete one district and prepare for a new one) in UPDATE.EXE by searching for the string 'L.EQ.'. Source codes for the FORTRAN programs, EXTRACT.EXE, MERGE.EXE, AERIAL.EXE, GROUND.EXE, UPDATE.EXE, and CONVRBAS.EXE are presented in Appendices I-N. The source code for the FORTRAN programs will have an .FOR extension instead of .EXE.

The 1992 version of the *Fish Ticket* programs writes tab characters in SPECIES.LST. These tab characters must be removed with a text editor before the file can be read by the program EXTRACT.EXE. If you are using a KEDIT as your text editor, the command EXPAND \* will replace tab characters with an appropriate number of blank spaces (Appendix C).

Check catch dates carefully in the oral catch and *Fish Ticket* files to avoid errors in the harvest estimates. The MERGE.EXE program will accept catches from the same harvest area in both files, if the dates are different. The program was written to accept oral catch report dates without a corresponding *fish ticket* date because *fish ticket* data are not available until a week or more after harvests have occurred. The program also will accept *fish ticket* data without corresponding oral catch data because oral reports are preliminary and may not contain all tender reports.

The inseason forecast output (Figure 16) has three columns of information that can be used to judge the reliability of the individual forecasts. Little confidence should be placed in forecasts with small historical sample sizes, particularly at the start of the run. Forecasts based on run timing curves tend to improve as the season progresses. Therefore, a late season forecast based on an average cumulative total run proportion of more than 0.50, tends to be more accurate than an early season forecast. Some forecasts will fluctuate widely from day to day because their run timing curves are based on a small number of observations (e.g., Cottonwood Bay pink salmon, Kirschner Lake chum salmon). Consult the plot of the average cumulative total run over time in Yuen (1993), if you suspect this problem.

The software presently allows comments from ground surveys to be entered into the data files. These comments are reproduced in GROUND and appear as footnotes in the run status reports. They also will be imported into the *Rbase* escapement database. Comments should be edited to ensure that they are clear but concise before they are imported into *Rbase*. Comments that are most useful concern conditions that affect the quality of the data (e.g. incomplete survey coverage or poor visibility).

Since different inseason duties are assigned to the various staff members, database and software responsibilities are also shared. Diskettes are used to transfer data to the computer housing the run status software. This will not be necessary once a local area network is installed.

#### **LITERATURE CITED**

Yuen, H.J. 1993. Lower Cook Inlet salmon run timing curves. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 2A93-34, Anchorage.

Table 1. Paired salmon spawning stream and harvest area codes for Lower Cook Inlet as listed in file CODES.LCI during the 1992 season.

Stream		Harvest Area		
Code	Name	Code	Name	Sequence <sup>a</sup>
1000	Homer Spit	24113	Homer Spit East	1
1020	Fox Creek	24114	Humpty Creek	2
1040	Clearwater Slough	24114	Humpty Creek	
1060	Humpty Creek	24114	Humpty Creek	
		24115	Halibut Cove Subdist.	3
1080	Halibut Cove Lagoon	24108	Halibut Cove Lagoon	4
1100	China Poot Bay	24109	China Poot Bay	5
	Hazel Lake Creek	24110	Neptune Bay	6
1120	Sadie Cove	24116	Tutka Bay	7
1140	Tutka Creek	24116	Tutka Bay	
1141	Tutka Lagoon	24116	Tutka Bay	
1142	Hatchery net pens	24116	Tutka Bay	
1160	Tutka Bay Head	24116	Tutka Bay	
1180	Jakolof Bay	24116	Tutka Bay	
1200	MacDonald Spit	24116	Tutka Bay	
1240	Seldovia River	24117	Seldovia Bay	8
1260	Fourth of July Cr (Seldovia)	24117	Seldovia Bay	
1220	Barabara Creek	24118	Barabara	9
1270	Port Graham Left	24120	Port Graham	10
1280	Port Graham River	24120	Port Graham	
1300	English Bay	24130	English Bay	11
2020	Dogfish Bay	23201	Dogfish Bay	12
2040	Port Chatham	23202	Port Chatham	13
2060	Anderson Beach	23203	Chugach Bay	14
2070	Chugach Bay	23203	Chugach Bay	
2080	Windy River Left	23204	Windy Bay	15
2100	Windy River Right	23204	Windy Bay	
2120	Scurvey Creek	23205	Rocky Bay	16
2140	Picnic Harbor	23205	Rocky Bay	
2160	Rocky River	23205	Rocky Bay	
2180	One Haul Bay	23205	Rocky Bay	
2300	Sunday Harbor	23206	Port Dick Entrance	17
2320	Takoma Cove	23206	Port Dick Entrance	
		23207	Port Dick South Sect.	18
2280	Taylor Bay	23208	Taylor Bay	19
2200	Port Dick-Head End Creek	23209	Port Dick North Sect.	20
2220	Port Dick-Slide Creek	23209	Port Dick North Sect.	
2240	Port Dick-Middle Creek	23209	Port Dick North Sect.	
2260	Port Dick-Island Creek	23209	Port Dick North Sect.	
2340	Tonsina Bay	23210	Petrof	21
2360	Petrof River	23210	Petrof	

-Continued-

Table 1 (page 2 of 3)

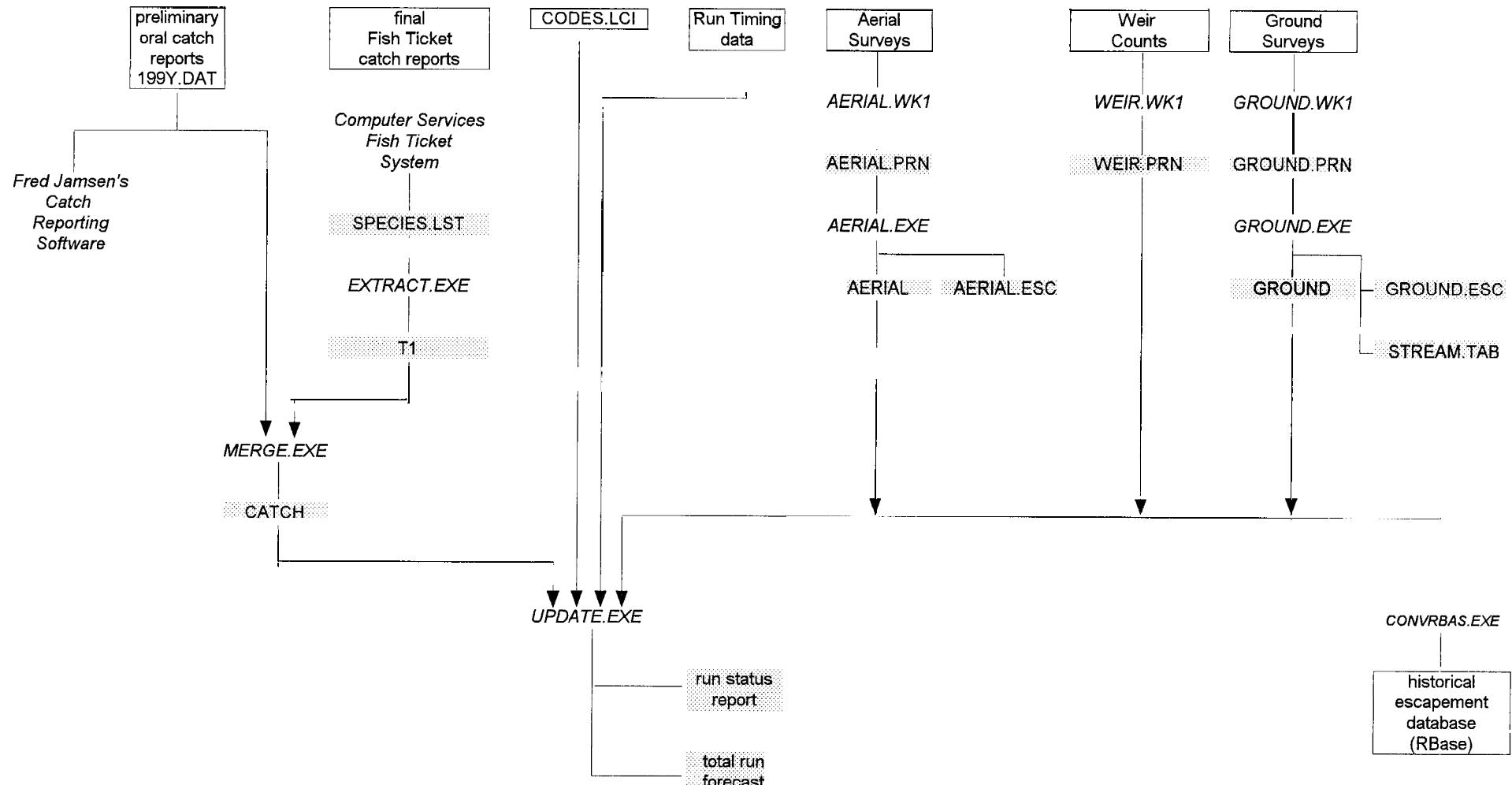
Stream		Harvest Area		
Code	Name	Code	Name	Sequence <sup>a</sup>
2380	Nuka Passage	23215	Nuka Island	22
2400	Nuka Island South Creek	23215	Nuka Island	
2420	Berger Bay	23215	Nuka Island	
2430	Herring Pete Bay	23215	Nuka Island	
2440	Mike's Bay	23215	Nuka Island	
2460	Home Cove	23215	Nuka Island	
2480	Nuka Bay West Arm	23222	Nuka Bay West Arm	23
2500	Yalik Bay	23222	Nuka Bay West Arm	
2520	Beauty Bay	23222	Nuka Bay West Arm	
2540	James Lagoon	23223	East Arm Nuka	24
2560	Desire Lake	23223	East Arm Nuka	
2580	Delight Lake	23223	East Arm Nuka	
2590	Ecstasy Lake	23223	East Arm Nuka	
2600	Two Arm Bay	23230	Harris Bay	25
2620	Harris Bay	23230	Harris Bay	
3020	Quicksand Cove	23105	Aialik Bay	26
3040	Aialik Lake	23105	Aialik Bay	
3300	Humpy Cove	23125	Renard Island	27
3060	Tonsina Creek	23130	Resurrection Bay North	29
3080	Airport Creek	23130	Resurrection Bay North	
3100	Salmon Creek	23130	Resurrection Bay North	
3120	Grouse Creek	23130	Resurrection Bay North	
3140	Bear Creek	23130	Resurrection Bay North	
3160	Clear Creek	23130	Resurrection Bay North	
3180	Jap Creek	23130	Resurrection Bay North	
3200	Mayor Creek	23130	Resurrection Bay North	
3220	Sawmill Creek	23130	Resurrection Bay North	
3240	Spring Creek	23130	Resurrection Bay North	
3260	Fourth of July Cr (Res Bay)	23130	Resurrection Bay North	
3280	Thumb Cove	23130	Resurrection Bay North	
3320	Day Harbor	23160	Day Harbor	30
4100	Bowser Creek	24990	Oil Bay	31
4120	Iniskin River	24985	Iniskin Bay	32
4130	Sugarloaf Creek	24985	Iniskin Bay	
4160	North Head Creek	24985	Iniskin Bay	
4180	Iliamna Bay	24983	Cottonwood Bay	33
4200	Cottonwood Creek	24983	Cottonwood Bay	
4210	Ursus Head Creek	24980	Ursus Cove	34
4220	Brown Peak Creek	24980	Ursus Cove	
4230	Ursus Lagoon Righthand	24980	Ursus Cove	
4240	Ursus Lagoon	24980	Ursus Cove	

-Continued-

Table 1 (page 3 of 3)

Stream		Harvest Area		
Code	Name	Code	Name	Sequence <sup>a</sup>
4260	Sunday Creek	24978	Rocky Cove	35
		24975	Kirschner Lake	36
4280	Bruin Lake Creek	24970	Bruin Bay	37
4300	Bruin Bay	24970	Bruin Bay	
4320	Amakdedori Creek	24955	Chenik Lake	38
4340	Chenik Creek	24955	Chenik Lake	
4360	Paint River	24952	Paint River	39
4380	McNeil River	24950	Mc Neil River	40
4400	Mikfik Creek	24950	Mc Neil River	
4420	Little Kamishak River	24945	Kamishak River	41
4440	Strike Creek	24945	Kamishak River	
4460	Big Kamishak River	24945	Kamishak River	
4480	Douglas Reef	24940	Douglas River	42
4500	Douglas Reef Main Left	24940	Douglas River	
4520	Douglas Beach	24940	Douglas River	
4540	Douglas Clearwater Tributary	24940	Douglas River	

<sup>a</sup> Sequence number is to provide a quick count of harvest areas but is not used by any of the software. The order in which the harvest areas appear in the reports is determined by the order in which they are listed in this file.

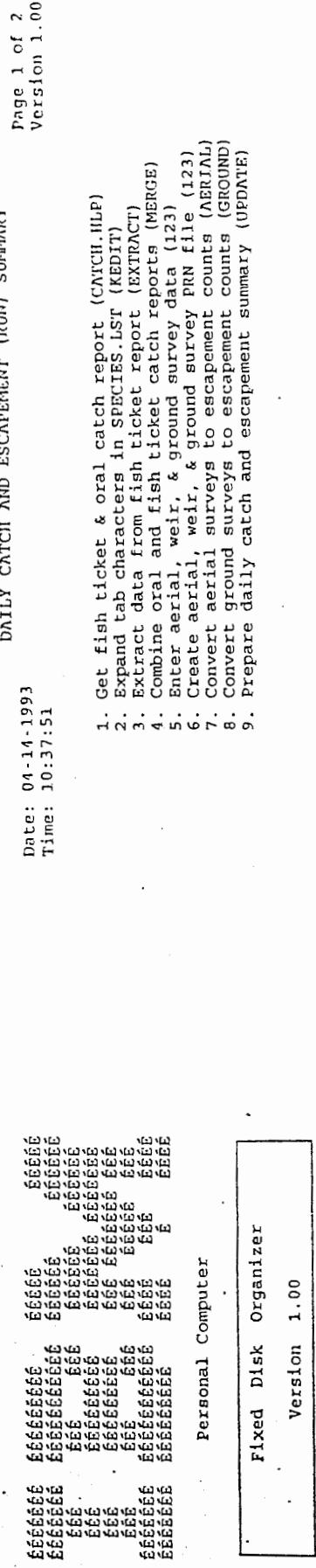


Legend:   data

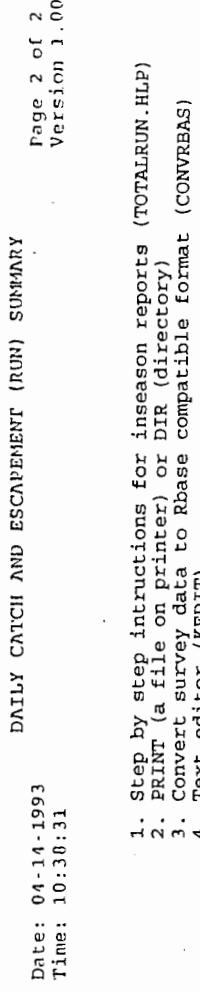
SOFTWARE : \*.EXE = FORTRAN program, \*.WK1 = LOTUS spreadsheet

output file

Figure 1. Flow chart of data, software, and output for run status reports in Lower Cook Inlet. See text for details.



↑ or ↓ point to option ENTER select option	F1 Help F7 Quit F9 Menu Maintenance PgDn Next page
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↑ or ↓ point to option ENTER select option	F1 Help F7 Quit F9 Menu Maintenance PgDn Next page
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Figure 2. Menus for run summary programs.

ALASKA DEPARTMENT OF FISH AND GAME  
 DIVISION OF COMMERCIAL FISHERIES  
 CENTRAL REGION FOR YEAR 1992

PURSE SEINE  
 023105

PRELIMINARY IN-SEASON COMMERCIAL HARVEST REPORT

REPORT DATE 09/21/1992

REPORT SELECTED F--1992 COMMERCIAL SALMON CATCH

CATCH MM/DD	PERMITS	LANDINGS	CHINOOK NUMBER	POUNDS	SOCKEYE NUMBER	POUNDS	COHO NUMBER	POUNDS	PINK NUMBER	POUNDS	CHUM NUMBER	POUNDS
07/09	1	1			6	41	1	6				
08/10	5	5			106	670	216	1,694	4,201	14,603	38	256
08/11	3	3			77	449	232	1,480	10,600	37,104	37	231
08/13	5	5			25	166	6	52	6,458	19,364	3	24
08/14	6	6			71	511	72	686	22,185	66,636	2	8
08/17	6	6			32	200	128	1,179	4,170	13,047		
08/18	6	6			49	337	148	1,463	5,633	16,907	5	37
08/19	1	1			18	100	33	223	1,576	6,047	1	5
08/20	2	2			16	108	30	242	752	2,266		
08/21	1	1			4	32	105	1,050	1,868	5,604		
08/22	1	1			22	109	97	889	2,147	7,086		
08/25	1	1			6	43	63	630	417	1,252		
TOTALS	7	38			432	2,766	1,131	9,594	60,007	189,916	86	561
AVERAGE					6.40			8.48		3.16		6.52

Figure 3. Example of SPECIES.LST, the final catch report file extracted from the Fish Ticket system.

1992	1	23105	24	0709	1	0	0	6	41	1	6	0	0	0	0
1992	1	23105	24	0810	5	0	0	106	670	216	1694	4201	14603	38	256
1992	1	23105	24	0811	3	0	0	77	449	232	1480	10600	37104	37	231
1992	1	23105	24	0813	5	0	0	25	166	6	52	6458	19364	3	24
1992	1	23105	24	0814	6	0	0	71	511	72	686	22185	66636	2	8
1992	1	23105	24	0817	6	0	0	32	200	128	1179	4170	13047	0	0
1992	1	23105	24	0818	6	0	0	49	337	148	1463	5633	16907	5	37
1992	1	23105	24	0819	1	0	0	18	100	33	223	1576	6047	1	5
1992	1	23105	24	0820	2	0	0	16	108	30	242	752	2266	0	0
1992	1	23105	24	0821	1	0	0	4	32	105	1050	1868	5604	0	0
1992	1	23105	24	0822	1	0	0	22	109	97	889	2147	7086	0	0
1992	1	23105	24	0825	1	0	0	6	43	63	630	417	1252	0	0

Note: Columns are no longer aligned when titles and headings are removed.

Figure 4. Example of T1, the Fish Ticket report stripped of report titles and column headings.

1992	1	23105	24	709	1	0	0	6	41	1	6	0	0	0	0
1992	1	23105	24	810	5	0	0	106	670	216	1694	4201	14603	38	256
1992	1	23105	24	811	3	0	0	77	449	232	1480	10600	37104	37	231
1992	1	23105	24	813	5	0	0	25	166	6	52	6458	19364	3	24
1992	1	23105	24	814	6	0	0	71	511	72	686	22185	66636	2	8
1992	1	23105	24	817	6	0	0	32	200	128	1179	4170	13047	0	0
1992	1	23105	24	818	6	0	0	49	337	148	1463	5633	16907	5	37
1992	1	23105	24	819	1	0	0	18	100	33	223	1576	6047	1	5
1992	1	23105	24	820	2	0	0	16	108	30	242	752	2266	0	0
1992	1	23105	24	821	1	0	0	4	32	105	1050	1868	5604	0	0
1992	1	23105	24	822	1	0	0	22	109	97	889	2147	7086	0	0
1992	1	23105	24	825	1	0	0	6	43	63	630	417	1252	0	0

Figure 5. Example of CATCH, the merged catch file written by MERGE.EXE.

STREAM	1992 Aerial Survey Counts			sockeye	pink	chum	coho	add	this	add	this	add	this	add	this	
	10-Sep-92			m	d	aerial	aerial	aerial	aerial	sockeye	pink	chum	coho	0	B	
		CODE	n	y	o	a	survey	survey	survey	survey	bay	fish	bay	fish	bay	fish
Aialik Lake	3040	6	23			20										WB
Aialik Lake	3040	7	1			220										WB
Aialik Lake	3040	7	6			400										WB
Aialik Lake	3040	7	12			150										WB
Aialik Lake	3040	7	30			1750										LH
Aialik Lake	3040	8	27			2500										JD
Amakdedori Creek	4320	6	24			75										LH
Amakdedori Creek	4320	6	30			350										LH
Amakdedori Creek	4320	7	3			750										LH
Amakdedori Creek	4320	7	12			610										LH
Amakdedori Creek	4320	7	17			1140			100							LH
Amakdedori Creek	4320	7	26			1900			3200							LH
Amakdedori Creek	4320	7	29						200							WB
Amakdedori Creek	4320	8	7			1120			900							LH
Amakdedori Creek	4320	9	15													

Figure 6. Example of aerial survey data in the file named AERIAL.PRN written by spreadsheet AERIAL.WK1.

Bear Creek	3140	8	1	8
Bear Creek	3140	8	2	11
Bear Creek	3140	8	3	17
Chenik Lake	4340	6	20	1
Chenik Lake	4340	6	21	19
Chenik Lake	4340	6	22	6
Chenik Lake	4340	6	23	3
Chenik Lake	4340	6	24	112

Figure 7. Example of weir data in the file named WEIR.PRN written by spreadsheet WEIR.WK1.

1=intertidal      0-9999999 = data 2=stream      -1 = skip this date for this species												
location	z			pink			chum			sockeye		
	m	d	o	o	a	n	-	-	-	-	-	-
	code	n	y	e	live	carcass	live	carcass	live	carcass	comments (max 25 char)	
Barabara Creek	1220	7	10	1	0	0	0	0	0	0	7/10 Barabara, no fish	
Barabara Creek	1220	7	10	2	0	0	0	0	0	0		
Barabara Creek	1220	7	17	1	97	0	0	0	0	0		
Barabara Creek	1220	7	17	2	15	0	0	0	0	0		
Barabara Creek	1220	8	5	1	495	2	0	0	0	0		
Barabara Creek	1220	8	5	2	570	10	0	0	0	0		
Barabara Creek	1220	8	28	1	551	14	0	0	2	0		
Barabara Creek	1220	8	28	2	153	6	0	0	0	0		
Barabara Creek	1220	9	15	1	0	0	-1	-1	-1	-1		
Bear Creek	3140	8	18	2	1080	0	0	0	3	0		
Bear Creek	3140	9	15	2	0	0	-1	-1	0	0		

Figure 8. Example of ground survey data in the file named GROUND.PRN written by spreadsheet GROUND.WK1.

Amakdedori Creek	4320	42	6	24	75
Amakdedori Creek	4320	42	6	30	350
Amakdedori Creek	4320	42	7	3	750
Amakdedori Creek	4320	42	7	12	610
Amakdedori Creek	4320	42	7	17	1140
Amakdedori Creek	4320	42	7	26	1900
Amakdedori Creek	4320	42	7	29	0
Amakdedori Creek	4320	42	8	7	1120
Amakdedori Creek	4320	42	9	15	0
					1900
					0

Figure 9. Example of output file named AERIAL with daily and accumulated escapement estimates.

Aialik Lake		sockeye salmon (use peak count)			
date	days between survey	live count	peak count	bay fish	
7/ 1	62	220			
7/ 6	5	400			
7/12	6	150			
7/30	18	1750			
8/27	28	2500	2500	0	

Amakdedori Creek		pink salmon (17.5 day stream life)			
date	days between survey	live count	fish-days	accum esc.	bay fish
6/30	60	0	0		
7/ 3	4	0	0		
7/12	9	0	0		
7/17	5	100	250		
7/26	9	3200	14850		
7/29	3	200	5100		
8/ 7	9	900	4950		
9/15	39	0	17550	3200	0

NOTE: peak live count used instead of area under curve ( 2440)

Brown's Peak Creek		pink salmon (17.5 day stream life)			
date	days between survey	live count	fish-days	accum esc.	bay fish
7/17	16	1710	13680		
7/25	8	4000	22840		
7/29	4	2050	12100		
8/ 7	9	3200	23625		
8/14	7	230	12005		
9/15	32	0	3680	5025	0

Figure 10. Example of output file named AERIAL.ESC summarizing how the escapement was derived by AERIAL.EXE.

Barabara Creek	1220	44	7	10	0	
Barabara Creek	1220	44	7	17	112	
Barabara Creek	1220	44	8	5	1065	
Barabara Creek	1220	44	8	28	704	
Barabara Creek	1220	44	9	15	0	2186
Bear Creek	3140	44	8	18	1080	
Bear Creek	3140	44	9	15	0	2345
China Poot	1100	44	7	6	0	
China Poot	1100	44	7	9	0	
China Poot	1100	44	7	24	0	
China Poot	1100	44	8	4	32	
China Poot	1100	44	8	20	2980	
China Poot	1100	44	9	4	1955	
China Poot	1100	44	9	15	0	4116
Dogfish Creek	2020	44	7	7	0	7/7 Dogfish, some jumpers
Dogfish Creek	2020	44	7	28	0	1
Humpy Creek	1060	44	7	16	705	
Humpy Creek	1060	44	7	24	1084	
Humpy Creek	1060	44	8	4	2618	
Humpy Creek	1060	44	8	20	8219	
Humpy Creek	1060	44	9	4	6061	
Humpy Creek	1060	44	9	15	0	14853
Island Creek	2260	44	7	20	0	
Island Creek	2260	44	8	14	178	
Island Creek	2260	44	8	27	3745	
Island Creek	2260	44	9	9	9755	
Island Creek	2260	44	9	15	0	10143
Jakalof Creek	1180	44	7	21	0	
Jakalof Creek	1180	44	8	12	19	
Jakalof Creek	1180	44	9	15	0	30
James Lagoon	2540	44	8	6	197	
James Lagoon	2540	44	9	15	0	428
Port Chatham	2040	44	7	29	265	fish in lagoon
Port Chatham	2040	44	8	28	2818	
Port Chatham	2040	44	9	15	0	4304
Port Dick Creek	2200	44	7	9	0	
Port Dick Creek	2200	44	7	20	6	7/20 Pt Dick, cabin hole: 95 chum, 18 pink, 1 king
Port Dick Creek	2200	44	8	10	1319	2 coho, 1 king in IT 170 P, 23 CH, cabin hole
Port Dick Creek	2200	44	8	21	3775	
Port Dick Creek	2200	44	9	2	4464	
Port Dick Creek	2200	44	9	15	0	6881

Figure 11. Example of output file named GROUND with daily and accumulated escapement estimates.

Barabara Creek      pink salmon (17.5 day stream life)

days between	live	carcass	accum			
date	survey	count	count	fish-days	est. escapement	footnote
7/10	9	0	0	0	7/10 Barabara, no fish	
7/17	7	112	0	392		
8/ 5	19	1065	12	11182		
8/28	23	704	20	20344		
9/15	18	0	0	6336	2186	

Dogfish Creek      pink salmon (17.5 day stream life)

days between	live	carcass	accum			
date	survey	count	count	fish-days	est. escapement	footnote
7/ 7	6	0	0	0	7/7 Dogfish, some jumpers	
7/28	21	0	1	0	1	

NOTE: peak carcass count used instead of area under curve ( 0 )  
 NOTE: 7/28 live + carcass counts used instead of area under curve ( 0 )

Island Creek      pink salmon (17.5 day stream life)

days between	live	carcass	accum			
date	survey	count	count	fish-days	est. escapement	footnote
7/20	19	0	0	0	7/20 Island Creek	chum in left fork
8/14	25	178	0	2225		
8/27	13	3745	10	25500		
9/ 9	13	9755	388	87750		
9/15	6	0	0	29265	10143	

NOTE: 9/ 9 live + carcass counts used instead of area under curve ( 8271 )

Humpy Creek      sockeye salmon (use peak count)

days between	live	peak		
date	survey	count	count	
7/16	15	0		
7/24	8	0		
8/ 4	11	1		1 King Salmon
8/20	16	9		
9/ 4	15	7		4 coho in stream
9/15	11	0	9	

NOTE: peak live count used instead of area under curve ( 272 )  
 NOTE: 8/20 live + carcass counts used instead of area under curve ( 272 )

Figure 12. Example of output file named GROUND.ESC summarizing how escapement was derived by GROUND.EXE.

date	intertidal		stream	
	pink	chum	pink	chum
Humpy Creek 7/17	4	18	16	75
Port Dick Creek 7/18	70	717	0	0
	610	2660	571	53

Figure 13. Example of STREAM.TAB which summarizes ground surveys by tidal zone and species.

\*24109 China Poot Bay      Sockeye salmon run time curve  
 Mo Da Low Mean Hi n 0.0      0.2      0.4      0.6      0.8      1.0  
 6 24 .00 .00 .00 1 X  
 6 25 .00 .00 .00 2 X  
 6 26 .00 .00 .00 3 X  
 6 27 .00 .01 .02 4 XH  
 6 28 .00 .01 .02 4 LX  
 6 29 .00 .02 .03 4 LXH  
 6 30 .00 .02 .04 4 LXH  
 7 1 .00 .04 .09 4 L X H  
 7 2 .01 .05 .10 4 L X H  
 7 3 .03 .07 .11 4 LX H  
 7 4 .05 .11 .17 4 L X H  
 7 5 .06 .13 .19 4 L X H  
 7 6 .08 .16 .23 4 L X H  
 7 7 .10 .17 .25 4 L X H  
 7 8 .12 .20 .28 4 L X H  
 7 9 .16 .23 .29 4 L X H  
 7 10 .21 .25 .30 4 L X H  
 7 11 .23 .33 .43 4 L X H  
 7 12 .24 .36 .48 4 L X H  
 7 13 .27 .41 .55 4 L X H  
 7 14 .27 .43 .58 4 L X H  
 7 15 .32 .47 .62 4 L X H  
 7 16 .43 .54 .64 4 L X H  
 7 17 .57 .64 .71 4 L X H  
 7 18 .65 .73 .80 4 L X H  
 7 19 .72 .78 .84 4 L X H  
 7 20 .76 .80 .85 4 L X H  
 7 21 .77 .83 .88 4 L X H  
 7 22 .80 .86 .92 4 L X H  
 7 23 .88 .90 .92 4 LXH  
 7 24 .92 .93 .94 4 XH  
 7 25 .94 .95 .97 4 LX  
 7 26 .96 .97 .98 4 XH  
 7 27 .96 .97 .99 4 LX  
 7 28 .96 .98 1.00 4 LXH  
 7 29 .97 .98 1.00 4 XH  
 7 30 .98 .99 1.00 3 X  
 7 31 .99 1.00 1.00 3 X  
 8 1 1.00 1.00 1.00 3 X  
 8 2 1.00 1.00 1.00 2 X  
 8 3 1.00 1.00 1.00 2 X

Figure 14. Example of run timing data in RUNTIME.RED.

8/12/1993 16: 5:59

Table 1. Preliminary Lower Cook Inlet SOCKEYE salmon daily run summary thru 8/12/1993

FISHERY	DATE	C A T C H MOST RECENT	ACCUM	G R O U N D MOST RECENT	ACCUM	A E R I A L MOST RECENT	PEAK	WEIR DATE	TOTAL RUN ACCUM
<b>SOUTHERN DISTRICT</b>									
Humpy Creek	7/ 6	271	271						
Humpy Creek				8/11	24	24			
Total Run									295
Halibut Cove Subdist.	8/ 4	3	12,199						
Total Run									12,199
Halibut Cove Lagoon	8/11		3,057						
Total Run									3,057
China Poot Bay	8/ 4	37	51,665	8/11	425	425			
China Poot Bay									52,090
Total Run									
Neptune Bay	8/ 5	198	47,904						
Total Run									47,904
Tutka Bay	8/11	40	5,834						
Total Run									5,834
Seldovia Bay	8/11		4,557	8/ 9	4	4			
Seldovia River									
Total Run									4,561
Barabara	8/11	13	3,308						
Total Run									3,308
English Bay							7/15	8,939	
English Bay									8,939
Total Run									
<b>DISTRICT TOTAL</b>			<b>128,795</b>			<b>453</b>		<b>8,939</b>	<b>138,187</b>
<b>OUTER DISTRICT</b>									
Port Dick South Sect.	8/10		1,260						
Total Run									1,260
Port Dick North Sect.									
Port Dick-Head End Cr	8/ 2	1	1						
Total Run									1
Nuka Island	8/11		76						
Total Run									76
East Arm Nuka	8/ 6		3,295	8/12	1	1			
James Lagoon							8/10	10,960	
Desire Lake							8/10	1,700	
Delight Lake							8/10	5,000	
Ecstasy Lake							8/10	1,300	
Total Run									20,556
<b>DISTRICT TOTAL</b>			<b>4,631</b>			<b>2</b>		<b>17,260</b>	<b>21,893</b>

-continued-

Figure 15. Example of total run summary produced inseason.

EASTERN DISTRICT

Aialik Bay	8/10		11		7/16	3,000	3,000	
Aialik Lake								3,011
Total Run								
Renard Island	7/12	1	1					1
Total Run								
Rugged Island	7/12	1	1					1
Total Run								
Resurrection Bay North	7/ 6	47	1,609	7/22 7/22	115 2	115 2		
Bear Creek							8/ 8	5,025
Clear Creek								
Total Run								6,636
DISTRICT TOTAL			1,622		117		3,000	5,025
								9,649

KAMISHAK DISTRICT

Iniskin Bay					8/ 9	20	20	
North Head Creek								20
Total Run								
Ursus Cove					8/ 9	100	100	
Brown Peak Creek								
Ursus Lagoon					8/ 9	10	10	
Total Run								110
Kirschner Lake	7/30	2,000	42,810					
Total Run								42,810
Bruin Bay	7/14	1,650	2,399		8/ 2	1,500	1,500	
Bruin Lake Creek					8/ 9	700	800	
Bruin Bay								
Total Run								4,699
Chenik Lake	7/17	2,475	35,750		8/ 9		1,950	
Amakdedori Creek							8/ 9	4,000
Chenik Creek								
Total Run								41,700
Paint River					8/ 9	700	800	
Paint River								800
Total Run								
Mc Neil River	7/10		941		8/ 9		4	
McNeil River					7/26	1,260	3,650	
Mikfik Creek								
Total Run								4,595
Kamishak River					8/ 2		25	
Little Kamishak River							8/ 2	10
Strike Creek								10
Big Kamishak River					8/ 2		4,030	
Total Run								4,065
Douglas River	7/ 7	124	1,575					
Total Run								1,575
DISTRICT TOTAL			83,475			12,899	4,000	100,374

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TOTAL LOWER COOK INLET	218,523	572	33,159	17,964	270,103
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Figure 15. (page 2 of 2)

9/24/1992 16: 7:46

Table 2. Accum SOCKEYE catch and escapement , historical mean, & predicted total run size, 9/15/1992

FISHERY	MOST RECENT DATE	ACCUM CATCH & ESCAPEMENT	AVERAGE ACCUM TOTAL RUN (%)	HISTORICAL SAMPLE SIZE	PREDICT LOW	TOTAL AVERAGE	RUN HI
<hr/>							
SOUTHERN DISTRICT							
Halibut Cove Subdist.	9/15	12,187	1.00	1	12,187	12,187	12,187
Halibut Cove Lagoon	9/15	2,492	1.00	1	2,492	2,492	2,492
China Poot Bay	9/15	63,648	1.00	1	63,648	63,648	63,648
Neptune Bay	9/15	12,331	1.00	1	0	12,331	0
Tutka Bay	9/15	8,579	1.00	1	8,579	8,579	8,579
English Bay	8/25	6,354	1.00	5	6,354	6,354	6,418
<hr/>							
OUTER DISTRICT							
Port Dick (combined)	9/ 2	577	1.00	1	0	577	0
East Arm Nuka	8/14	18,750	.99	6	18,750	18,939	19,132
<hr/>							
EASTERN DISTRICT							
Aialik Bay	8/27	2,932	1.00	1	2,932	2,932	2,991
<hr/>							
KAMISHAK DISTRICT							
Kirschner Lake	9/15	40,043	1.00	1	40,043	40,043	42,598
Bruin Bay	9/15	2,443	1.00	1	2,443	2,443	9,772
Chenik Lake	7/30	23,062	.85	6	23,062	27,131	35,480
Mc Neil River	7/17	10,543	.99	3	10,543	10,649	10,758
Kamishak River	9/15	5,149	1.00	1	5,149	5,149	64,362

Figure 16. Example of forecast total run produced inseason from accumulated run and historical run timing data.

3/ 1/1993 15:38:22

Table 1. Preliminary Lower Cook Inlet SOCKEYE salmon total run summary, 1993

FISHERY	CATCH	ESCAPEMENT	TOTAL RUN
<hr/>			
SOUTHERN DISTRICT			
Humpy Creek			
Humpy Creek		9	9
Total Run			
Halibut Cove Subdist.	12,187		12,187
Total Run			
Halibut Cove Lagoon	2,492		2,492
Total Run			
China Poot Bay	63,648		63,648
Total Run			
Neptune Bay	12,331		12,331
Total Run			
Tutka Bay	8,578		8,578
Tutka Creek		1	
Total Run			
Seldovia Bay	3,285		3,285
Seldovia River		8	
Total Run			
Barabara	4,272		4,272
Barabara Creek		2	
Total Run			
English Bay			
English Bay	6,354		6,354
Total Run			
DISTRICT TOTAL	106,793	6,374	113,167
<hr/>			
OUTER DISTRICT			
Port Chatham			
Port Chatham		3	3
Total Run			
Windy Bay			
Windy River Left		1	1
Total Run			
Port Dick Entrance	150		150
Total Run			
Port Dick South Sect.	422		422
Total Run			
Port Dick North Sect.			
Port Dick-Head End Creek		5	5
Total Run			
East Arm Nuka			
Desire Lake	11,900		
Delight Lake	5,850		
Ecstasy Lake	1,000		
Total Run			
DISTRICT TOTAL	572	18,759	19,331

-continued-

Figure 17. Example of total run summary produced post season.

EASTERN DISTRICT

Aialik Bay	432			
Aialik Lake		2,500		
Total Run			2,932	
Resurrection Bay North				
Bear Creek		1,921		
Total Run			1,921	
DISTRICT TOTAL	432	4,421	4,853	

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KAMISHAK DISTRICT

Ursus Cove	13			
Total Run			13	
Rocky Cove	15			
Total Run			15	
Kirschner Lake	40,043			
Total Run			40,043	
Bruin Bay	503			
Bruin Bay		40		
Total Run			543	
Chenik Lake	14,378			
Amakdedori Creek		1,900		
Chenik Creek		9,269		
Total Run			25,547	
Paint River				
Paint River		300		
Total Run			300	
Mc Neil River	3,963			
Mikfik Creek		6,580		
Total Run			10,543	
Kamishak River	289			
Little Kamishak River		230		
Strike Creek		30		
Big Kamishak River		4,600		
Total Run			5,149	
Douglas River	9,643			
Douglas Clearwater Tributary		200		
Total Run			9,843	
DISTRICT TOTAL	68,847	23,149	91,996	

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TOTAL LOWER COOK INLET     176,644     52,703     229,347

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note: final aerial survey may include bay fish

Figure 17. (page 2 of 2)

3280, 8/09/91, 1, 'G', 1, 0, 0,	1592,	0, 0, 0,	159,	1, 0, 0
3060, 8/09/91, 1, 'G', 1, 0, 0,	25,	2, 0, 0,	152,	4, 0, 0
3280, 8/09/91, 1, 'G', 2, 0, 0,	37,	0, 0, 0,	10,	0, 0, 0
3060, 8/09/91, 1, 'G', 2, 0, 0,	75,	3, 0, 0,	221,	1, 0, 0

Figure 18. Example of aerial and ground survey data in Rbase compatible format.

**APPENDICES**

Appendix A. Who does what to produce an inseason salmon total run report.

Oral catch report data is in the C:\TOTALRUN directory on Wes' computer. Fish Ticket data is in the C:\TICKET92 directory on Trish's computer. Software, file named CODES.LCI, and run timing data are in the C:\TOTALRUN directory on Henry's computer. Aerial survey and weir count data is in the C:\TOTALRUN directory on Lee's computer. Ground survey data is in the C:\TOTALRUN directory on Henry's computer.

STEP 1: Copy oral catch data from Wes' computer to a diskette with the following commands: CD\TOTALRUN and COPY 1992.DAT A:

STEP 2: Copy fish ticket data from Trish's computer to a diskette with the following commands: CD\TICKET92 and COPY SPECIES.LST A:

STEP 3: Copy aerial survey and weir data from Lee's computer to a diskette with the following commands: CD\TOTALRUN, COPY AERIAL.WK1 A:, and COPY WEIR.WK1 A:.

STEP 4: Go to Henry's computer. Make sure you are in the TOTALRUN directory with the command C:\TOTALRUN. Then copy data from the diskette to Henry's computer with the following commands: COPY A:1992.DAT, COPY A:SPECIES.LST, AERIAL.WK1, and COPY A:WEIR.WK1.

STEP 5: Start the software with the command TOTALRUN.

STEP 6: Wes and Trish handles option 1 and you already obtained their data with steps 1, 2, and 3. Select option 2 (to expand tab characters in SPECIES.LST)

STEP 7: Select option 3 (to extract data from fish ticket report)

STEP 8: Select option 4 (to combine oral report with fish ticket catch report). The program will ask for the name of the oral report catch file name (e.g. 1992.DAT)

STEP 9: Tom, Greg and Lee performed option 5 and the end of their surveys. Tom and Greg's data is already on Henry's computer in the directory C:\TOTALRUN. You already obtained Lee's data with steps 3 and 4. Select option 6 (create weir, aerial and ground survey PRN files).

STEP 10: Select option 7 (convert aerial surveys to escapement counts)

STEP 11: Select option 8 (convert ground surveys to escapement counts)

STEP 12: Select option 9 (to prepare daily catch and escapement summary). Select one species at a time. Select option 1 (for inseason report). The output file names are: CHINOOK.1, SOCKEYE.1, SOCKEYE.2, CHUM.1, CHUM.2, PINK.1, PINK.2, CHUM.1, and CHUM.2.

STEP 13: Press the F7 key to exit.

STEP 14: Adjust the paper on the OKIDATA u97 microline printer so the perforations between pages is just above the print head. Turn the printer off. Hold down the TOF SET key and turn the printer back on while you continue to hold down the TOF SET key. This will turn the small print (17 characters/inch) option on.

STEP 15: Enter the command PRINT \*.1 to print the total run summaries. When the message 'Name of list device [PRN]:' appears, press the enter key. Enter the command PRINT \*.2 to print the run time estimates.

STEP 16: Wes and Lee get a copy. Save the original for Henry.

Appendix B. Help file for obtaining catch data.

PRELIMINARY ORAL CATCH DATA

The oral catch report file is on Wes Bucher's computer, in the C:/TOTALRUN directory and is named after the year of harvest, e.g. 1992.DAT. The data is entered manually with a text editor. Data format of 199Y.DAT (as well as T1 and CATCH) is: year, gear (1=seine, 4=set gillnet), district, hours, date, # deliveries, catch (chinook, sockeye, coho, pink, chum). Data is space delimited. The files T1 and CATCH have 5 additional columns for weight. (chinook, red, coho, pink, chum).

An example of 199Y.DAT would be:

1991 4 24118 24 828 2 0 68 165 0 1

-----  
FINAL FISH TICKET DATA

The fish ticket catch file is on Trish McNeill's computer. To get a fish ticket report:

- 1) Sign onto the fish ticket computer and enter the command 'TICKET'.
- Answer the menu prompts as follows:
- 2) press the F5 key (for management report)
- 3) press the F1 key (for report selection menu)
- 4) F (for salmon)
- 5) F (for report by gear and report area ...)
- 6) P (for permit)
- 7) D (for date)
- 8) press the enter key when the REPORT AREA CODES menu appear
- 9) S (for stat area)
- 10) press the enter key when the gear type menu appear
- 11) F (to create a report file)
- 12) N (for no cover page)
- 13) press the tab key (for report title)
- 14) N (for no report censoring)
- 15) press the tab key (for file name)
- 16) 66 (lines per page)
- 17) N (for no page breaks)
- 18) 2 (for region code)
- 19) press the enter key when the Ticket Selection Panel appears
- 20) press the tab key 16 times to get to the year panel

- 21) x (to select the year option)
- 22) press the enter key to get the year selection panel
- 23) enter the year (when the year selection panel appears)
- 24) F5 (to write the report)
- 25) press the F10 key twice to exit.

The output will be in a file names SPECIES.LST. Copy that file onto this computer with the command COPY\>C:\TICKET\SPECIES.LST A:

-----  
Use KEDIT to replace the tab character in SPECIES.LST  
e.g. KEDIT SPECIES.LST (starts the KEDIT software)  
EXPAND \* (replaces the tab character with blanks)  
FILE (exit and saves your file with the revisions)

-----  
Use the program EXTRACT to search for data and write it to a file named T1.

-----  
The program MERGE will combine the two files T1 and 199Y.DAT into one named CATCH. The fish ticket data will take precedence over the oral report data. If there is no fish ticket data, the oral report data will be used.

-----  
The FORTRAN program UPDATE will then read the file CATCH when it writes the daily catch and escapement summary.

Appendix C. Help file for expanding tab characters in SPECIES.LST.

The fish ticket software writes tab characters in its output files including SPECIES.LST. Tab characters were intended for a printer. It creates problems for other computer programs. Therefore, use KEDIT to replace the tab characters with blank.

e.g. KEDIT SPECIES.LST (starts the KEDIT software)  
SET TABS INCR 8  
EXPAND \* (replaces the tab character with blanks)  
FILE (exit and saves your file with the revisions)

Appendix D. Help file for extracting Fish Ticket data.

The FORTRAN program named EXTRACT.FOR will search for the file named SPECIES.LST (from the Fish Ticket system) and condenses the catch data into a file named T1.

The condensed catch data in T1 will be combined with the oral catch report data (e.g. 1992.DAT) by the program named MERGE.FOR. The results (where fish ticket data will take precedence over oral catch report data when available) will be in a file named CATCH. CATCH. will then be read by the UPDATE.FOR program which combines catch and escapement in a total run summary.

Appendix E. Help file for merging catch data.

This program was designed to merge the oral catch report file with the fish ticket catch file.

The oral catch report file is on Wes Bucher's computer, in the C:/CATCH directory and is named after the year of harvest, e.g. 1990.DAT.

The fish ticket catch file is on Trish McNeill's computer. Details on how to obtain this data is in CATCH.HLP. Basically a file named SPECIES.LST is created on the fish ticket computer. That file is copied onto this computer. The data is extracted by the program EXTRACT into a file named T1.

This program will read both T1 and 199y.DAT and merge the two into a file named CATCH. The fish ticket data will take precedence over the oral report data. If there is no fish ticket data, the oral report data will be used.

The program UPDATE will then read the file CATCH for the daily catch and escapement summary.

## Appendix F. Help file for keypunching escapement data.

Survey data are keypunched by the person conducting the survey or receiving the data over the phone.

### AERIAL SURVEYS

Enter aerial survey data in a Lotus 123 spreadsheet named AERIAL.WK1. The data should be in alphabetical order. Separate streams with a blank line. Don't forget the /File Save command before you exit from the spreadsheet.

At the end of the season, include any fish offshore that should be added to the total escapement (column labeled 'add this bay fish to esc.'). These are the so called 'bay-fish' that were seen offshore from the air but had not entered the stream by the time the ground surveys ended.

### GROUND SURVEYS

Enter ground survey data in a Lotus 123 spreadsheet named GROUND.WK1. The data should be in alphabetical and date order. Streams are separated by a blank line. Don't forget the /File Save command before you exit from the spreadsheet.

At the end of the season, enter the date when you expect stream counts to return to zero. This tells the computer programs reading this data where to stop when estimating area under the stream count curve. A later end date will result in a greater final escapement estimate and vice versa, so choose the end date carefully. You can estimate the last day for multiple species. For example, assume 9/5 as the last day for chum salmon and 9/15 for pink salmon. On 9/5 enter the chum salmon stream counts as 0 and the pink salmon stream counts as -1. On 9/15 enter the chum salmon stream counts as -1 and the pink salmon stream counts as 0. All of the programs reading the data will ignore negative numbers (e.g. -1).

### DAILY WEIR COUNTS

Enter daily weir counts (not cumulative counts) in a Lotus 123 spreadsheet named WEIR.WK3. The data should be in alphabetical order. Separate streams with by a blank line. Don't forget the /File Save command before you exit from the spreadsheet.

Appendix G. Help file for creating PRN files from escapement spreadsheets.

- 1) Make sure you are in the C:/TOTALRUN directory with the command / File Directory.

The aerial survey, ground survey, and weir spreadsheets are named AERIAL.WK1 or WK3, GROUND.WK1 or WK3, and WEIR.WK1 or WK3, respectively. The data should have been entered by the person conducting the survey or receiving the counts over the phone.

- 2) Retrieve the aerial survey spreadsheet with the command / File Retrieve. Page down and find the last line of data.
- 3) Create an aerial PRN file with the command / Print File AERIAL.PRN Replace Range (make sure the range matches the last line number you found in step 2) Go Quit.
- 4) Retrieve the ground survey spreadsheet with the command / File Retrieve. Page down and find the last line of data.
- 5) Create a ground PRN file with the command / Print File GROUND.PRN Replace Range (make sure the range matches the last line number you found in step 4) Go Quit.
- 6) Retrieve the weir spreadsheet with the command / File Retrieve. Page down and find the last line of data.
- 7) Create a weir PRN file with the command / Print File WEIR.PRN Replace Range (make sure the range matches the last line number you found in step 6) Go Quit.
- 8) Exit with the command /Quit Yes.

Appendix H. Help file for the program AERIAL.EXE.

The FORTRAN program AERIAL.EXE will search for the file AERIAL.PRN,

1) convert the aerial survey counts to escapement counts, and

2) write 2 output files: AERIAL. which will be read by the FORTRAN program UPDATE.EXE for the daily catch and escapement summary and AERIAL.ESC which is a summary of daily aerial survey activity.

The FORTRAN program AERIAL.EXE assumes a 17.5 day stream life when converting PINK AND CHUM aerial survey to escapement counts. For SOCKEYE salmon, it searches for the peak survey instead. In either case, the aerial survey data should be stream and intertidal fish only. Streamlife is alright for the fish in the stream but not for fish in the bay. Aerial survey counts, therefore, should not be a mix of the two, except for the very last survey when bay fish are added to the final escapement estimate (i.e. those that had not entered the stream where they could be counted by the time the field season ended). The 17.5 day stream life is not applied to the 'bay fish'.

Only the data of the first observer is used, even though the spreadsheet accepts data from a second observer. This program does NOT average the data from 2 or more observers.

Appendix I. Help file for the program named GROUND.EXE.

The FORTRAN program GROUND.EXE will search for the file GROUND.PRN,

- 1) convert the stream surveys to escapement counts, and
- 2) write 3 files: STREAM.TAB, GROUND.ESC, and GROUND.

The file named STREAM.TAB is a summary of daily stream survey counts by tidal zone and species. This is the printout used to update the weekly bulletin board.

The file named GROUND.ESC is a summary of daily live and carcass counts as well as total escapement (17.5 day stream life adjustment for pink and chum salmon and peak counts for sockeye salmon). If the program finds a 'peak live' or 'peak live + carcass' count greater than the escapement estimate based on a 17.5 day stream life, it will print the higher estimate.

The file named GROUND is read by another FORTRAN program named UPDATE for the daily catch and escapement summary.

Appendix J. Help file for run status report.

The program UPDATE will (for each species):

- 1) Summarize on one sheet of paper: oral catch reports and fish ticket data by fishing district, weirs, ground and aerial surveys by stream, and current run size by fishing district for all salmon stocks in Lower Cook Inlet.
- 2) Summarize, by fishing district, average historical accumulated run up to the most recent catch or escapement date and predict a total run size.

There are two options:

Option 1 is for inseason use. It will incorporate all available data, list the most recent data as well as the running total, and try to predict a total run based on historical run time curves.

Option 2 is for post season use. It will list only total catch, escapement, and run size.

This program automatically reads 8 data files:

CATCH. : Combined fish ticket and oral catch report file created by the program MERGE from T1 and 199Y.DAT. On any given day, if both fish ticket and oral catch report data are present, the fish ticket data will be used and the oral catch data will be ignored by the program MERGE. Otherwise, this program will use whatever is available. T1 was created from SPECIES.LST (the fish ticket output file) and the program EXTRACT.EXE.

GROUND. : Ground escapement survey data file created by the program GROUND.EXE using the GROUND.PRN print file created from the GROUND.WK1 spreadsheet. Spreadsheets are used to simplify data entry. Data should be grouped by stream (order is not important) and presorted by date in the spreadsheet.

AERIAL. : Aerial survey data file created by the program AERIAL from the AERIAL.PRN print file created from the AERIAL.WK1 spreadsheet. Spreadsheets are used to simplify data entry. Data should be grouped by stream (order is not important) and presorted by date in the spreadsheet.

WEIR.PRN: Weir count print file created from the WEIR.WK1 spreadsheet. The data should be grouped by stream (order is not important) and sorted by date in the spreadsheet.

RUNTIME.CHO: Historical summary of coho salmon run timing by fishing district for Lower Cook Inlet.

RUNTIME.RED: Historical summary of sockeye salmon run timing by fishing district for Lower Cook Inlet.

RUNTIME.PNK: Historical summary of pink salmon run timing by fishing district for Lower Cook Inlet.

RUNTIME.CHM: Historical summary of chum salmon run timing by fishing district for Lower Cook Inlet.

This program will prompt you for 1 (chinook only) or 2 (all other species) output files:

- 1) catch and escapement summary report which can be handed out to the public, and

2) a historical run time summary and predicted total run (if option 1 is selected) which should not be handed out to the public unless Wes Bucher or Henry Yuen had a chance to review the output.

This program combines data from the input files as follows:

- 1) All catch reports will be accumulated into daily totals regardless of gear type.
- 2) The larger of the ground survey or aerial survey data will be used to estimate escapement and calculate total run. If aerial survey data include 'Bay' fish, the program assumes those fish will eventually enter the escapement. If at a later date, the 'Bay' fish do not enter the escapement, then those 'Bay' fish that moved else where, wound up in the catch, etc, should be subtracted from the aerial survey data files to prevent total run estimates from double counting.

Appendix K. Help file for rewriting inseason escapement data into Rbase format.

CONVRBAS

This program will read the following inseason data files: GROUND. and AERIAL.

This program will then write following files that can be imported into the RBASE escapement databases: KAMI, OUTER, EAST, and SOUTH. The files from the aerial surveys are: RBASEG.SOU, RBASEG.EAS, RABSEG.OUT, and RBASEG.KAM. Those from the ground surveys are: RBASEA.SOU, RBASEA.EAS, RABSEA.OUT, and RBASEA.KAM

Weir counts, if any, are also included with the aerial survey data because neither require the 17.5 day stream life conversion that pink and chum estimates do from the ground surveys. If weir counts are present, you need to edit either RBASEA.SOU, RBASEA.EAS, RABSEA.OUT, or RBASEA.KAM and change the method codes from 'A' to 'W' as required.

---

- 1) To import the data into RBASE, start the RBASE software by typing RBASE.
- 2) Select the TOOLS menu and the IMPORT/EXPORT option.
- 3) Select the IMPORT menu and its ASCII DELIMITED option.
- 4) Supply the appropriate input file name, e.g., RBASEG.SOU
- 5) Answer YES to the IMPORTING DATE VALUES? prompt.
- 6) Select the MM/DD/(YY)YY option, the press the F2 key.
- 7) Choose the appropriate database, e.g. SOUTH.
- 8) Choose the SALMON table.
- 9) Select the APPEND option.
- 10) RBASE will ask 'ENTER THE COLUMN SEPARATOR CHARACTER'. The correct response is a comma (,).
- 11) Press the F2 key to continue. Watch the screen. The number of rows loaded into the data base should match the number of rows in the import file. If not, the difference should match the number of rows in the exception file. When, RBASE is done (it will say press any key to continue), select the EXIT option and edit the file named EXCEPT.DAT. Delete the data that are truly duplicates. RBASE will not accept more than one survey per species for each stream and date combination, regardless of method. So if both ground and aerial surveys were conducted on the same day on the same stream, assign one of the surveys number 1 and the other number 2. Then import the EXCEPT.DAT file following the steps described above.

Appendix L. Source code for FORTRAN program EXTRACT.EXE.

```

C      Given file with report "F" from fish ticket system with permits, landings,
C      number & pounds of salmon by day for each gear type and stat area
C      Write out file for salmon catch fisheries system

C      Number of salmon ----- Pounds of salmon ----- Average weight

C      -----
C      | Upper Cook Inlet, Lower Cook Inlet, Togiak
C      | 20 FORMAT| "C 6" for UCI & LCI
C      | 910 FORMAT| "C 7" for Togiak
C      | -----
C      Unit 01 = Input      Unit 02 = Output

DIMENSION GEARNM(5),NGEAR(5),T(132),TT(132)
CHARACTER GEARNM*13,GEAR*13,GEARX*13,FNAME*25,T*1,TT*1
CHARACTER CLOCK*29,BEEP*1,FORMF*1
DATA GEARNM/' PURSE SEINE ',
&           'DRIFT GILLNET',
&           'SET GILLNET',
&           'HAND TROLL',
&           'HATCHERY' /
DATA NGEAR/1,3,4,5,7/

CALL ACODES(BEEP,FORMF)
CALL TIME1(CLOCK)

      WRITE(*,20) CLOCK
20 FORMAT(50X,A29//)
& ' Extract data from fish ticket "F" report file',
& ' named SPECIES.LST')
C & ' The pattern we are looking for is: '
C & '     gear name in columns 6-18 (PURSE SEINE or SET GILLNET or /
C & '                               HATCHERY or HAND TROLL) '
C & '     subdistrict in columns 7-11 on next line'
C & '     skip 5 lines'
C & '     0 or more lines with date ',
C & ' (month in col.1-2, / in col.3, day in col.4-5) '
C & '                               permits, '
C & '                               landings, '
C & '                               num & lbs of Chinook, '
C & '                               num & lbs of Sockeye, etc.')
C

OPEN(1,FILE='SPECIES.LST')
OPEN(2,FILE='T1')

50 READ(CLOCK,'(18X,I4)') JYCURR
      WRITE(*,52) JYCURR
52 FORMAT(/' Enter year ( e.g.,I5,'):  '\)
      READ(*,*) JYEAR
      IF(JYEAR.LT.1960 .OR. JYEAR.GT.1999) GOTO 50

100 GEARX=GEAR

110 READ(1,'(132A1)',END=900) (T(I),I=1,132)
      IF(T(3).NE.'/') GOTO 120
      NG=0
      JSUBDX=JSUBD

```

```

JSUBD=0
WRITE(*,115) GEARX,JSUBDX,BEEP
115 FORMAT('/>>>>>',  

& ' Unable to extract gear and subdistrict in table' /9X,  

& ' following table with gear = ',A13,' and subdistrict = ',I6,A1)
GOTO 205

120 WRITE(GEAR,'(13A1)') (T(I),I=6,18)

C.....CHECK FOR VALID GEAR
DO 125 I=1,5
JGEAR=I
IF(GEAR.EQ.GEARNM(I)) GOTO 130
125 CONTINUE
GOTO 110
130 NG=NGEAR(JGEAR)

JSUBDX=JSUBD
READ(1,'(6X,I5)',END=900) JSUBD
C.....TRY AGAIN IF HIDDEN CONTROL CHARACTER PRESENT
IF(JSUBD.EQ.0) READ(1,'(6X,I5)',END=900) JSUBD
IERROR=0
IF(JSUBD.EQ.0) IERROR=1

C FIND LINE OF DASHES
DO 150 I=1,10
READ(1,'(2X,A1)') T(3)
IF(T(3).EQ.'-') GOTO 200
150 CONTINUE

200 READ(1,'(132A1)',END=900) (T(I),I=1,132)
IF(T(3).NE.'//') GOTO 100

IF(IERROR.EQ.0) GOTO 205
IERROR=0
WRITE(*,202) GEARX,JSUBDX,BEEP
202 FORMAT('/>>>>>',  

& ' Unable to extract gear in table' /9X,  

& ' following table with gear = ',A13,' and subdistrict = ',I6,A1)

C F O U N D   A   L I N E   W I T H   C A T C H   D A T A
205 DO 210 I=1,10
J=11*I+22
IF(T(J).EQ.' ') T(J)='0'
210 CONTINUE

LAST=132
NTT=0
DO 235 I=15,LAST
IF(T(I).EQ.' ') GOTO 235
NTT=NTT+1
TT(NTT)=T(I)
235 CONTINUE

WRITE(2,240) JYEAR,NG,JSUBD,T(1),T(2),T(4),T(5),
& (TT(I),I=1,NTT)
240 FORMAT(I4,I2,I6,' 24',1X,132A1)
GOTO 200

900 WRITE(*,910)
910 FORMAT('/' Output file is named T1')
STOP

```

```

END
C
-----
      SUBROUTINE TIME1(CLOCK)
C                                         12 Sep 1988 version
C   Put current day name, 'day, month name, year, military time into CLOCK
C
C   Note: Day name for 1960 thru 1999 only

      DIMENSION MDAY(12),MCUM(12)
      DIMENSION MONTH(12),JAN1(40),DAY9R(7)

      CHARACTER CLOCK*29,MONTH*3,DAY9R*9

      DATA MONTH/'Jan','Feb','Mar','Apr','May','Jun',
&           'Jul','Aug','Sep','Oct','Nov','Dec'/
      DATA MDAY/31,28,31,30,31,30,31,31,30,31,30,31/

      DATA JAN1/6,1,2,3,4,6,7,1,2,4, 5,6,7,2,3,4,5,7,1,2,
&           3,5,6,7,1,3,4,5,6,1, 2,3,4,6,7,1,2,4,5,6/

      DATA DAY9R/ 'Sunday',' Monday',' Tuesday',
& 'Wednesday',' Thursday',' Friday',' Saturday'/

C   Put current day - month - year into CLOCK
      CALL GETDAT(KYEAR,KMONTH,KDAY)
      CALL GETTIM(KHOUR,KMIN,KSEC,K100TH)

      IF(KMONTH.LT.1 .OR. KMONTH.GT.12 .OR.
& KYEAR.LT.1960 .OR. KYEAR.GT.1999) GOTO 100

      MDAY(2)=28
      JJJ=KYEAR/4
      LEAPYR=KYEAR-4*JJJ
      IF(LEAPYR.EQ.0) MDAY(2)=29

      MCUM(1)=0
      DO 60 I=2,12
60  MCUM(I)=MDAY(I-1)+MCUM(I-1)

      J1=JAN1(KYEAR-1959)
      JDAY=MCUM(KMONTH)+KDAY
      J2=JDAY/7
      J3=JDAY-7*J2
      J4=J3+J1-1
      IF(J4.EQ.0) J4=7
      IF(J4.GT.7) J4=J4-7

      WRITE(CLOCK,90) DAY9R(J4),KDAY,MONTH(KMONTH),KYEAR,KHOUR,KMIN
90  FORMAT(A9,' ',I3,1X,A3,I5,' ',I2.2,:',I2.2)
      RETURN

100 CLOCK=' '
      RETURN
      END
C
-----
      SUBROUTINE ACODES(BEEP,FORMF)
C   BEEP  is ASCII character code 007 (beep)
C   FORMF is ASCII character code 012 (form feed)
      CHARACTER BEEP*1,FORMF*1
      BEEP='^G'

```

```
FORMF=' '
RETURN
END
```

Appendix M. Source code for FORTRAN program MERGE.EXE.

```
$DEBUG
C      Read file named 'T1.      ' created by EXTRACT.EXE
C      Read oral report file named 'yyyy.DAT' ceated with text editor (yyyy =
year)
C      When more than 1 oral report/day (same stat area & gear code), combine into
daily total
C      Write a file where oral report data is updated by fish ticket data
C      when present (keep oral report data if no fish ticket data)
C      COMBINE CATCHES IF MORE THAN ONE REPORT/DAY (e.g. multiple deliveries,
gear, etc)

C      ORDER OF VARIABLES:
C      1=YEAR, 2=GEAR, 3=STATAREA, 4=HRS FISHED, 5=DATE, 6=NO.DELIVERIES
C      7=KING #, 8=KING POUNDS
C      9=KING #, 10=KING POUNDS
C      11=KING #, 12=KING POUNDS
C      13=KING #, 14=KING POUNDS
C      15=KING #, 16=KING POUNDS
C      INTEGER N(16),FT(16,1000),OR(16,1000),TEMP(16,1000)
C      CHARACTER FNAME*40,WHICH*1

NX=1
NOR=1
NFT=1
GOTO 120

C      O P E N      ORAL CATCH REPORT   F I L E
100 WRITE(*,'(14H Can not find ,A40,9HTry again)') FNAME
120 WRITE(*,1300)
1300 FORMAT(/' Enter ORAL REPORT catch file name',
& ' (e.g. 1971.DAT) :  '\)
      READ(*,'(A)') FNAME
      CLOSE(1)
      OPEN(1,FILE=FNAME,STATUS='OLD',ERR=100)
      GO TO 210

C      O P E N      FISH TICKET   F I L E
210 OPEN(2,FILE='T1.      ')

C      OPEN OUTPUT FILE
OPEN(3,FILE='CATCH.      ')

C.....READ ORAL REPORT CATCH DATA
400 CALL VREAD(NX,1,11,N,IERR,IEEND)
      WRITE(*,3600)
3600 FORMAT('+' , 'READING ORAL CATCH DATA')
      IF(IEEND.EQ.1) GOTO 500
      DO 440 I=1,7
      TEMP(I,NX)=N(I)
440 CONTINUE
C.....ORAL REPORTS HAVE NO WEIGHTS
      TEMP(8,NX)=0
      TEMP(9,NX)=N(8)
      TEMP(10,NX)=0
      TEMP(11,NX)=N(9)
      TEMP(12,NX)=0
      TEMP(13,NX)=N(10)
      TEMP(14,NX)=0
      TEMP(15,NX)=N(11)
```

```

        TEMP(16,NX)=0
        NX=NX+1
        GO TO 400

500 NX=NX-1
C     SORT ORAL CATCH REPORT DATA BY STAT AREA AND DATE
DO 640 J=1,NX-1
WRITE(*,3700)
3700 FORMAT('+' , 'SORTING ORAL CATCH DATA')
DO 640 K=J+1,NX
C     LCI STAT AREA ARE ALL 2nnnn (hence STAT AREA -20,000)
A=((TEMP(3,J)-20000)*1000)+TEMP(5,J)
B=((TEMP(3,K)-20000)*1000)+TEMP(5,K)
IF(A.GT.B)GO TO 610
GO TO 640
610 DO 620 I=1,16
ITEMP=TEMP(I,J)
TEMP(I,J)=TEMP(I,K)
TEMP(I,K)=ITEMP
620 CONTINUE
640 CONTINUE

C     IF MORE THAN ONE (ORAL REPORT) GEAR TYPE OR
C     MORE THAN ONE REPORT FOR SAME STAT AREA THEN COMBINE INTO DAILY TOTAL
DO 690 J=1,NX
WRITE(*,3800)
3800 FORMAT('+' , 'COMBINING ORAL CATCH DATA')
J1=J+1
A=((TEMP(3,J)-20000)*1000)+TEMP(5,J)
B=((TEMP(3,J1)-20000)*1000)+TEMP(5,J1)
IF(A.NE.B)GO TO 670
C     ADD UP DELIVERIES, CATCH, AND POUNDS
C     YEAR, STAT AREA, HOURS, AND DATE REMAIN UNCHANGED
C     GEAR CODE IS NOT IMPORTANT
DO 650 I=6,16
TEMP(I,J1)=TEMP(I,J)+TEMP(I,J1)
650 CONTINUE
GO TO 690
670 DO 680 I=1,16
OR(I,NOR)=TEMP(I,J)
680 CONTINUE

NOR=NOR+1
690 CONTINUE

NX=1
C.....READ FISH TICKET CATCH DATA
710 CALL VREAD(NY,2,16,N,IERR,IEND)
WRITE(*,3900)
3900 FORMAT('+' , 'READING FISH TICKET DATA ')
IF(IEND.EQ.1) GOTO 725
DO 720 I=1,16
TEMP(I,NX)=N(I)
720 CONTINUE
NX=NX+1
GO TO 710

725 NX=NX-1

C     SORT FISH TICKET CATCH REPORT DATA BY STAT AREA AND DATE
DO 750 J=1,NX-1
WRITE(*,4000)

```

```

4000 FORMAT('+' , ' SORTING FISH TICKET DATA ')
DO 750 K=J+1,NX
C   LCI STAT AREA ARE ALL 2nnnn (hence STAT AREA -20,000)
A=((TEMP(3,J)-20000)*1000)+TEMP(5,J)
B=((TEMP(3,K)-20000)*1000)+TEMP(5,K)
IF(A.GT.B) GO TO 730
GO TO 750
730 DO 740 I=1,16
ITEMP=TEMP(I,J)
TEMP(I,J)=TEMP(I,K)
TEMP(I,K)=ITEMP
740 CONTINUE
750 CONTINUE

C   IF MORE THAN ONE (FISH TICKET) GEAR TYPE OR
C   MORE THAN ONE REPORT FOR SAME STAT AREA THEN COMBINE INTO DAILY TOTAL
DO 810 J=1,NX
WRITE(*,4100)
4100 FORMAT('+' , ' MERGING FISH TICKET & ORAL CATCH DATA ')
J1=J+1
A=((TEMP(3,J)-20000)*1000)+TEMP(5,J)
B=((TEMP(3,J1)-20000)*1000)+TEMP(5,J1)
IF(A.NE.B) GO TO 790
C   ADD UP DELIVERIES, CATCH, AND POUNDS
C   YEAR, STAT AREA, HOURS, AND DATE REMAIN UNCHANGED
C   GEAR CODE IS NOT IMPORTANT
DO 780 I=6,16
TEMP(I,J1)=TEMP(I,J)+TEMP(I,J1)
780 CONTINUE
GO TO 810
790 DO 800 I=1,16
FT(I,NFT)=TEMP(I,J)
800 CONTINUE

NFT=NFT+1
810 CONTINUE

C   COMBINE FISH TICKET WITH ORAL REPORT DATA
C   USE FISH TICKET DATA.  IF NONE, THEN USE ORAL REPORT DATA

J=1
K=1

C   CHECK END OF RECORD
815 IF(K.EQ.NOR.OR.J.EQ.NFT) GO TO 840
C   CHECK DISTRICT CODE
IF(OR(3,K).EQ.FT(3,J)) GO TO 820

C   FIND WHICH HAS LOWER DISTRICT CODE
IF(OR(3,K).GT.FT(3,J)) GO TO 817
C   SAVE DATA WITH LOWER DISTRICT CODE
C   AND ADVANCE COUNTER OF LOWER DISTRICT CODE
WRITE(3,4050)(OR(I,K),I=1,16)
4050 FORMAT(I4,I2,I6,I4,I5,I4,10I7)
K=K+1
GO TO 815
817 WRITE(3,4050)(FT(I,J),I=1,16)
J=J+1
GO TO 815

C   CHECK DATE
820 IF(OR(5,K).EQ.FT(5,J)) GO TO 830

```

```

C      FIND WHICH HAS LOWER DATE
C      IF(OR(5,K).GT.FT(5,J)) GO TO 823
C      SAVE DATA WITH LOWER DATE
C      AND ADVANCE COUNTER OF LOWER DATE
C      WRITE(3,4050) (OR(I,K),I=1,16)
C      K=K+1
C      GO TO 815
823  WRITE(3,4050) (FT(I,J),I=1,16)
J=J+1
GO TO 815

C      SAME DATE
830  WRITE(3,4050) (FT(I,J),I=1,16)
C      ADVANCE BOTH COUNTERS
J=J+1
K=K+1
GO TO 815

C      WHICH ARRAY STILL HAS RECORDS REMAINING
840  IF(J.LT.NFT) GO TO 860
C.....SAVE REMAINING RECORDS
DO 850 KK=K,NOR-1
WRITE(3,4050) (OR(I,KK),I=1,16)
850  CONTINUE
STOP

860  DO 870 JJ=J,NFT-1
      WRITE(3,4050) (FT(I,JJ),I=1,16)
870  CONTINUE
STOP

      END

```

---

```

-----  

SUBROUTINE VREAD(NREC,IUNIT,NVAR,IVAR,IERR,IEND)  

C      Read the NRECh record from unit IUNIT  

C      & check for the correct number of variables NVAR  

C      & store variables in integer array IVAR

```

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```

C      IERR=1 if error found  

C      IEND=1 if end-of-file found  

C      NV is the number of variables found

```

```

DIMENSION T(150),IVAR(50)
CHARACTER T*1

```

```

IEND=0
IERR=0
NV=0

```

```

READ(IUNIT,'(150A1)',END=300) (T(I),I=1,150)

```

```

C      Find LAST COLUMN which does not contain a comma or blank
DO 30 I=1,150
LAST=151-I
IF(T(LAST).NE.' ') GOTO 50
30 CONTINUE
WRITE(*,40) NREC,NVAR
40 FORMAT(/' On record',I4,' expecting',I3,' variables',
& ' but found a blank line')
GOTO 200

```

```

C      Find FIRST COLUMN which does not contain a comma or blank
50 DO 60 I=1, LAST
      IFIRST=I
      IF(.NOT.(T(I).EQ.' ' .OR. T(I).EQ.',')) GOTO 70
60 CONTINUE

C      COUNT NUMBER OF VARIABLES = NV
70 JFIRST=IFIRST
      NV=1
      NBLANK=0

      DO 110 I=IFIRST, LAST
      IF(T(I).EQ.' ' .OR. T(I).EQ.',') GOTO 80
      NBLANK=0
      GOTO 110

80 NBLANK=NBLANK+1
      IF(NBLANK.NE.1) GOTO 100
      IVAR(NV)=0
      DO 90 J=JFIRST, I-1
      READ(T(J), '(I1)') IDIGIT
      IVAR(NV)=10*IVAR(NV)+IDIGIT
90 CONTINUE
      NV=NV+1
100 JFIRST=I+1
110 CONTINUE

      IVAR(NV)=0
      DO 130 J=JFIRST, LAST
      READ(T(J), '(I1)') IDIGIT
      IVAR(NV)=10*IVAR(NV)+IDIGIT
130 CONTINUE

      IF(NVAR.EQ.NV) RETURN

      WRITE(*,150) NREC,NVAR,NV, (T(I), I=1, LAST)
150 FORMAT(/' On record', I4, ', expecting', I3,
      & ' but found', I3, ' variables'/1X,79A1/1X,41A1)

200 IERR=1
      IF(NV.GT.NVAR) RETURN
      DO 210 I=NV+1, NVAR
210 IVAR(I)=0
      RETURN

300 IEND=1
      RETURN
      END

```

Appendix N. Source code for FORTRAN program AERIAL.EXE

```
$DEBUG
C..... WRITE FILE OF DAILY PINK, CHUM, AND SOCKEYE ESCAPEMENT
C..... FOR INSEASON PROGRAMS
C..... WRITE TABLE OF ESCAPEMENT ESTIMATES
C..... USE 17.5 DAY STREAM LIFE ESTIMATE FOR PINK AND CHUM
C..... USE PEAK DAY FOR SOCKEYE
C.....
C..... ESTIMATE ESCAPEMENT ONLY THRU LAST SURVEY
C..... TO REVISE PROGRAM TO ESTIMATE ESCAPEMENT THRU 9/15 OR LAST SURVEY
C..... WITH COUNT=0, SEARCH FOR Cxxxx
C.....
C..... KEEP BAY FISH (FROM END OF SEASON) SEPARATE FOR STREAM AND INTERTIDAL
C.....
C..... INPUT DATA FILE SHOULD HAVE 5 LEADING BLANK OR HEADER LINES
C..... SEPARATE STREAMS WITH A BLANK LINE
C..... ORDER IN DATA FILE: 1=SOCKEYE, 2=PINK, 3=CHUM, 4=COHO
C.....
C..... IGNORE COHO DATA
C..... SKIP TUTKA LAGOON (1141) BECAUSE IT INCLUDES CATCH AND BROOD STOCK
    IMPLICIT DOUBLE PRECISION (A-H)
    IMPLICIT DOUBLE PRECISION (O-Z)
    CHARACTER*28 TEXT,BLANK,TSAV
    CHARACTER*7 SPECIES(3)
    REAL MON(120)
    DIMENSION DAY(120),SUML(120)
    INTEGER SCODE,CSAV,ICODE(3)
    DATA BLANK/'          /
    DATA SPECIES/'sockeye',' pink',' chum'/
    DATA ICODE/42,44,45/

    WRITE(*,1000)
1000 FORMAT('' this program will estimate escapement only thru '',
  &'last survey',/,,' add a record for 9/15 with zero counts ',/
  &' to get final escapement estimate',//)

    OPEN (1,FILE='AERIAL.PRN')
    OPEN (3,FILE='AERIAL.    ')
    OPEN (2,FILE='AERIAL.ESC')

C..... LOOP 3 TIMES, FOR SOCKEYE, PINK, CHUM
    30 DO 700 K=1,3
        REWIND 1
C..... SKIP FIRST 5 LINES
    DO 40 ISKIP=1,5
        READ(1,2000)
    40 CONTINUE
        ISTOP=0
        IPASS=0
C..... ASSUME ZERO COUNT ON FIRST DAY (7/10)
        MON(1)=7
C..... DAY(1)=10
C..... ASSUME DAY 1 = 7/1 FOR 1992
        DAY(1)=1
        DO 50 L=1,120
            SUML(L)=0
    50 CONTINUE
        TOTAL=0

C..... THEREFORE ASSIGN FIRST DATA TO DAY 2
        N=2
```

```

C.....DATA1=STREAM AND INTERTIDAL COUNTS
C.....DATA2=BAY FISH
C.....IF K = 1: SOCKEYE
  100 IF(K.EQ.1) READ(1,2000,END=290) TEXT,SCODE,IM,ID,DATA1,DATA2
  2000 FORMAT(A28,I4,I2,I3,F9.0,3(9X),F9.0)
C.....IF K = 2: PINK
  2045 IF(K.EQ.2) READ(1,2045,END=290) TEXT,SCODE,IM,ID,DATA1,DATA2
  2045 FORMAT(A28,I4,I2,I3,9X,F9.0,3(9X),F9.0)
C.....IF K = 3: CHUM
  2040 IF(K.EQ.3) READ(1,2040,END=290) TEXT,SCODE,IM,ID,DATA1,DATA2
  2040 FORMAT(A28,I4,I2,I3,2(9X),F9.0,3(9X),F9.0)
C.....SKIP DUMMY DATA
  100 IF(DATA1.LT.0.OR.DATA2.LT.0) GO TO 100
C.....SKIP TUTKA LAGOON BECAUSE IT INCLUDES CATCH AND BROOD STOCK
  100 IF(SCODE.EQ.1141) GO TO 100
C.....SKIP BLANK LINES
  100 IF(TEXT.EQ.BLANK) GO TO 100
C.....SKIP IF NO DATE
  100 IF(IM.EQ.0.AND.ID.EQ.0) GO TO 100
  2050 WRITE(*,2050) TEXT,SCODE,IM,ID,SPECIES(K)
  2050 FORMAT('+',A28,1X,I4,1X,I2,'/',I2,1X,A7)

  90 IF(IPASS.EQ.1) GO TO 101
    TSAV=TEXT
    CSAV=SCODE
    IDATE=(IM*100)+ID
    IDSAV=IDATE
    IPASS=1
    MON(N)=IM
    DAY(N)=ID

C.....PROCESS ONLY ONE STREAM AT A TIME
  101 IF(TEXT.EQ.TSAV) GO TO 102
    GO TO 300

C.....ASSIGN DAY NUMBERS TO ZONE COUNTS
  102 IDATE=(IM*100)+ID
    IF(IDATE.EQ.IDSAV) GO TO 103
    N=N+1
    IDSAV=IDATE
    MON(N)=IM
    DAY(N)=ID
  103 SUML(N)=DATA1
    IBAY=DATA2
    TOTAL=TOTAL+DATA1+DATA2
    GO TO 100

  290 ISTOP=1
  300 STRMLIFE=17.5
    IF(TOTAL.EQ.0) GO TO 600

    IF(K.NE.1) WRITE(2,2100) TSAV,SPECIES(K),STRMLIFE
  2100 FORMAT(//,A20,' ',A7,' salmon (',F4.1,' day stream life)')
    IF(K.EQ.1) WRITE(2,2105) TSAV,SPECIES(K)
  2105 FORMAT(//,A20,' ',A7,' salmon (use peak count)')

C.....N1=N FOR ALL CASES, ESTIMATE ESCAPEMENT ONLY THRU LAST SURVEY
  N1=N

Cxxxxx OTHERWISE LET N1=N+1, ESTIMATE ESCAPEMENT THRU 9/15
Cxxxxx OR LAST SURVEY IF COUNTS = 0 (IN WHICH CASE N1=N)
Cxxxxx ISW=1

```

```

CxxxxxxCHECK IF LAST SURVEY COUNT = 0
CxxxxxxIF (SUML(N) .NE. 0) GO TO 350
CxxxxxxN1=N
CxxxxxxISW=0
CxxxxxxGO TO 360

Cx350xN1=N+1
CxxxxxxASSUME ZERO COUNT ON LAST DAY (9/15) UNLESS DATA INDICATE OTHERWISE
CxxxxxxMON(N1)=9
CxxxxxxDAY(N1)=15
CxxxxxxSUML(N1)=0

C.....FIND PEAK COUNT
 360 PEAKL=0
    IPBM=0
    IPBD=0
    DO 450 I=2,N1
      IF(SUML(I) .LE. PEAKL) GO TO 450
      PEAKL=SUML(I)
      IPBM=MON(I)
      IPBD=DAY(I)
 450 CONTINUE

  IF(K.EQ.1) WRITE(2,2400)
2400 FORMAT(7X,'days between      live      peak      bay',
     & /,1X,'date       survey      count      count      fish')
     IF(K.NE.1) WRITE(2,2500)
2500 FORMAT(7X,'days between      live      accum      bay',
     & /,1X,'date       survey      count fish-days   esc.      fish')

C.....SUMMARIZE DAILY COUNTS (ALL SPECIES) AND AREA UNDER CURVE (PINK AND CHUM)
  MN=MON(1)
  IDA=DAY(1)
  NDAY=0
  IPL=SUML(1)
C.....DON'T PRINT OUTPUT FOR 7/10 OR DAY 1 (WHICH IS ASSUMED TO BE ZERO)
  C  WRITE(2,3000) MN,IDA,NDAY,IPL

  ACCUM=0
  DO 590 I=2,N1
    I1=I-1
C.....CONVERT DATE TO DAY NUMBER
  DAYS=DAY(I)-DAY(I1)
  IF(MON(I) .NE. MON(I1)) DAYS=DAYS+31

  IF(K.EQ.1) GO TO 460

C.....PINK AND CHUM ONLY
C.....CONVERT SURVEY COUNT TO FISH-DAYS (AREA UNDER THE CURVE)
C.....CALCULATE AREA UNDER "CURVE"
C.....BASE OF RECTANGLE = NUMBER OF DAYS
C.....HEIGHT OF RECTANGLE = AVERAGED SURVEY COUNT
C.....i.e. (SURVEY(I) + SURVEY(I-1))/2
  AREA=DAYS*(SUML(I)+SUML(I1))/2
C.....DIVIDE BY STREAM LIFE TO GET ESCAPEMENT
  ESC=AREA/STRMLIFE
C.....ACCUM SURVEY PERIOD TOTALS
  ACCUM=ACCUM+ESC
  IA=AREA+.5
  IE=ESC+.5
  ISUM=ACCUM+.5
  IF(I.EQ.N1) IAREA=ISUM

```

```

        IF(I.EQ.N1.AND.ISUM.LT.PEAKL) ISUM=PEAKL

460 MN=MON(I)
      IDA=DAY(I)
      NDAY=DAYS
      IL=SUML(I)
      IF(K.EQ.1) ISUM=PEAKL

CxxxxxTHE FOLLOWING IS USED ONLY
CxxxxxWHEN ESTIMATING ESCAPEMENT THRU 9/15
CxxxxxOR LAST SURVEY IF COUNTS = 0
CxxxxxIF LAST SURVEY = 0 (ISW=0), THEN GO DIRECTLY TO PRINT
CxxxxxIF(ISW.EQ.0) GO TO 580

C.....IF LAST SURVEY > 0 (ISW=1), SAVE OUTPUT,
C.....DON'T PRINT OUTPUT FOR 9/15 (WHICH IS ASSUMED TO BE ZERO)
C.....INSTEAD PRINT LAST ACTUAL SURVEY PLUS TOTAL ESCAPEMENT

CxxxxxIF(I.EQ.N1) GO TO 570
CxxxxxISAV1=MN
CxxxxxISAV2=IDA
CxxxxxISAV3=NDAY
CxxxxxISAV4=IL
CxxxxxISAV6=IA
CxxxxxIF(I.EQ.N) GO TO 590
Cx570xMN=ISAV1
CxxxxxIDA=ISAV2
CxxxxxNDAY=ISAV3
CxxxxxIL=ISAV4
CxxxxxIA=ISAV6

C.....OUTPUT FOR INSEASON DAILY RUN SUMMARY PROGRAMS
  IF(I.LT.N1) WRITE(3,2900) TSAV,CSAV,ICODE(K),MN,IDA,IL
2900 FORMAT(A22,I4,1X,I2,I2,1X,I2,3I9)
  IF(I.EQ.N1) WRITE(3,2900) TSAV,CSAV,ICODE(K),MN,IDA,IL,ISUM,IBAY

  IF(K.NE.1) GO TO 580
C.....OUTPUT FOR SOCKEYE DAILY AERIAL SURVEY ESCAPEMENT SUMMARIES
  IF(I.LT.N1) WRITE(2,3000) MN,IDA,NDAY,IL
  IF(I.EQ.N1) WRITE(2,3000) MN,IDA,NDAY,IL,ISUM,IBAY
  GO TO 590

C.....OUTPUT FOR PINK AND CHUM DAILY AERIAL SURVEY ESCAPEMENT SUMMARIES
  580 IF(I.LT.N1) WRITE(2,3000) MN,IDA,NDAY,IL,IA
  3000 FORMAT(I2,'/',I2,3X,5I9)
  IF(I.EQ.N1) WRITE(2,3000) MN,IDA,NDAY,IL,IA,ISUM,IBAY

C.....SKIP IF NO LIVE COUNTS
  IF(ISUM.EQ.0) GO TO 590

  IF(I.EQ.N1.AND.ISUM.EQ.PEAKL) WRITE(2,3400) IAREA
3400 FORMAT(' NOTE: peak live count used instead of area under curve (
  &',I9,',')
  590 CONTINUE
  600 IPASS=0
  N=2
  DO 650 L=1,120
  SUML(L)=0
  650 CONTINUE
  TOTAL=0
  IF(ISTOP.EQ.0) GO TO 90

```

```
700 CONTINUE
WRITE(*,4000)
4000 FORMAT(/, ' printout of escapement is in file named AERIAL.ESC', /)
STOP
END
```

Appendix O. Source code for FORTRAN program GROUND.EXE.

```
$DEBUG
C.....WRITE FILE OF DAILY PINK AND CHUM ESCAPEMENT FOR INSEASON PROGRAMS
C.....WRITE TABLE OF ESCAPEMENT ESTIMATES USING STREAM LIFE ESTIMATES
C.....ESTIMATE ESCAPEMENT ONLY THRU LAST SURVEY
C.....TO REVISE PROGRAM TO ESTIMATE ESCAPEMENT THRU 9/15 OR LAST SURVEY
C.....WITH COUNT=0, SEARCH FOR Cxxxx
C.....INPUT DATA FILE SHOULD HAVE 8 LEADING BLANK OR HEADER LINES
C.....SEPARATE STREAMS WITH A BLANK LINE
C.....ZONE 1=INTERTIDAL, 2=STREAM (BAY COUNTS NOT USED)
C.....IGNORE NEGATIVE STREAM COUNTS
C.....SKIP SOCKEYE
      IMPLICIT DOUBLE PRECISION (A-H)
      IMPLICIT DOUBLE PRECISION (O-Z)
      CHARACTER*25 FOOTNOTE(90,2),FNOTE,SAV7,SAV8
      CHARACTER*20 TEXT,BLANK,TSAV
      CHARACTER*7 SPECIES(3)
      REAL MON(90)
      DIMENSION DAY(90),SUML(90),SUMC(90)
      INTEGER SCODE,CSAV,ICODE(3)
      DATA BLANK//          /
      DATA SPECIES// 'pink','chum','sockeye'/
      DATA ICODE/44,45,42/

      WRITE(*,1000)
1000 FORMAT(/' this program will estimate escapement only thru ',,
     &'last survey',//,' add a record for 9/15 with zero counts ',,
     &' to get final escapement estimate'/' )

      OPEN (1,FILE='GROUND.PRN')
      OPEN (2,FILE='GROUND.ESC')
      OPEN (3,FILE='GROUND.    ')

C.....LOOP 3 TIMES, FOR PINK, CHUM, SOCKEYE
      30 DO 700 K=1,3
         REWIND 1
C.....SKIP FIRST 8 LINES
      DO 40 ISKIP=1,8
         READ(1,2000)
      40 CONTINUE
         ISTOP=0
         IPASS=0
C.....ASSUME ZERO COUNT ON FIRST DAY (7/10)
         MON(1)=7
C.....DAY(1)=10
C.....ASSUME DAY 1 = 7/1 FOR 1992
         DAY(1)=1
         DO 50 L=1,90
            SUML(L)=0
            SUMC(L)=0
            DO 50 M=1,2
               FOOTNOTE(L,M)='
      50 CONTINUE
         TOTAL=0

C.....THEREFORE ASSIGN FIRST DATA TO DAY 2
         N=2
C.....IF K = 1: PINK
      100 IF(K.EQ.1)READ(1,2000,END=290) TEXT,SCODE,IM,ID,IZN,DATA1,DATA2
           &,FNOTE
```

```

2000 FORMAT(A20,I4,2I3,I2,2F7.0,29X,A25)
C.....IF K = 2: CHUM
    IF(K.EQ.2) READ(1,2040,END=290) TEXT,SCODE,IM,ID,IZN,DATA1,DATA2
    &,FNOTE
2040 FORMAT(A20,I4,2I3,I2,14X,2F7.0,15X,A25)
C.....IF K = 3: SOCKEYE
    IF(K.EQ.3) READ(1,2045,END=290) TEXT,SCODE,IM,ID,IZN,DATA1,DATA2
    &,FNOTE
2045 FORMAT(A20,I4,2I3,I2,28X,2F7.0,1X,A25)
C.....SKIP BLANK LINES
    IF(TEXT.EQ.BLANK) GO TO 100
C.....SKIP IF NO DATE
    IF(IM.EQ.0.AND.ID.EQ.0) GO TO 100
C.....SKIP NEGATIVE NUMBERS
    IF(DATA1.LT.0.OR.DATA2.LT.0) GO TO 100
    WRITE(*,2050) TEXT,IM, ID, IZN, SPECIES(K)
2050 FORMAT('+',A20,I2,2X,I2,2X,I2,1X,A7,' main program')

90 IF(IPASS.EQ.1) GO TO 101
    TSAV=TEXT
    CSAV=SCODE
    IDATE=(IM*100)+ID
    IDSAV=IDATE
    IPASS=1
    MON(N)=IM
    DAY(N)=ID

C.....PROCESS ONLY ONE STREAM AT A TIME
101 IF(TEXT.EQ.TSAV) GO TO 102
    GO TO 300

C.....ASSIGN DAY NUMBERS TO ZONE COUNTS
102 IDATE=(IM*100)+ID
    IF(IDATE.EQ.IDSAV) GO TO 103
    N=N+1
    IDSAV=IDATE
    MON(N)=IM
    DAY(N)=ID

C.....ACCUM COUNTS (i.e. left, right, & headend creeks)
103 SUML(N)=SUML(N)+DATA1
    SUMC(N)=SUMC(N)+DATA2
    FOOTNOTE(N,IZN)=FNOTE
    TOTAL=TOTAL+DATA1+DATA2
    GO TO 100

290 ISTOP=1
300 STRMLIFE=17.5
    IF(TOTAL.EQ.0) GO TO 600

    IF(K.NE.3) WRITE(2,2100) TSAV,SPECIES(K),STRMLIFE
2100 FORMAT(//,A20,' ',A7,' salmon (',F4.1,' day stream life)')
    IF(K.EQ.3) WRITE(2,2105) TSAV,SPECIES(K)
2105 FORMAT(//,A20,' ',A7,' salmon (use peak count)')

C.....N1=N FOR ALL CASES, ESTIMATE ESCAPEMENT ONLY THRU LAST SURVEY
    N1=N

Cxxxxxx OTHERWISE LET N1=N+1, ESTIMATE ESCAPEMENT THRU 9/15
Cxxxxxx OR LAST SURVEY IF COUNTS = 0 (IN WHICH CASE N1=N)
Cxxxxxx ISW=1
Cxxxxxx CHECK IF LAST SURVEY COUNT = 0
Cxxxxxx IF(SUML(N).NE.0) GO TO 350

```

```

CxxxxxxN1=N
CxxxxxxISW=0
CxxxxxxGO TO 360

Cx350xN1=N+1
CxxxxxxASSUME ZERO COUNT ON LAST DAY (9/15) UNLESS DATA INDICATE OTHERWISE
CxxxxxxMON(N1)=9
CxxxxxxDAY(N1)=15
CxxxxxxSUML(N1)=0
CxxxxxxSUMC(N1)=0

C.....FIND LIVE & CARCASS COUNT
 360 PEAKL=0
    PEAKC=0
    PEAKB=0
    IPBM=0
    IPBD=0
    DO 450 I=2,N1
    BOTH=SUML(I)+SUMC(I)
    IF(BOTH.LE.PEAKB) GO TO 430
    PEAKB=BOTH
    IPBM=MON(I)
    IPBD=DAY(I)
  430 IF(SUML(I).LE.PEAKL) GO TO 440
    PEAKL=SUML(I)
  440 IF(SUMC(I).LE.PEAKC) GO TO 450
    PEAKC=SUMC(I)
  450 CONTINUE

C.....SUMMARIZE DAILY COUNTS AND AREA UNDER CURVE
  IF(K.EQ.3) WRITE(2,2400)
  2400 FORMAT(7X,'days between      live      peak',
    &/,1X,'date       survey      count      count')
  IF(K.NE.3) WRITE(2,2500)
  2500 FORMAT(7X,'days between      live      carcass      accum',
    &/,1X,'date       survey      count      count fish-days ',
    &' est. escapement           footnote')

  MN=MON(1)
  IDA=DAY(1)
  NDAY=0
  IPL=SUML(1)
  IPC=SUMC(1)

C.....DON'T PRINT OUTPUT FOR 7/10 OR DAY 1 (WHICH IS ASSUMED TO BE ZERO)
C     WRITE(2,3000) MN,IDA,NDAY,IPL,IPC

  ACCUM=0
  DO 590 I=2,N1
    I1=I-1
C.....CONVERT DATE TO DAY NUMBER
  DAYS=DAY(I)-DAY(I1)
  IF(MON(I).NE.MON(I1)) DAYS=DAYS+31

  IF(K.EQ.3) GO TO 460

C.....PINK AND CHUM ONLY
C.....CONVERT SURVEY COUNT TO FISH-DAYS (AREA UNDER THE CURVE)
C.....CALCULATE AREA UNDER "CURVE"
C.....BASE OF RECTANGLE OR TRIANGLE= NUMBER OF DAYS
C.....HEIGHT OF RECTANGLE OR TRIANGLE = AVERAGED SURVEY COUNT
C.....i.e. (SURVEY(I) + SURVEY(I-1))/2
  AREA=DAYS*(SUML(I)+SUML(I1))/2

```

```

C.....DIVIDE BY STREAM LIFE TO GET ESCAPEMENT
    ESC=AREA/STRMLIFE
C.....ACCUM SURVEY PERIOD TOTALS
    ACCUM=ACCUM+ESC
    IA=AREA+.5
    IE=ESC+.5
    ISUM=ACCUM+.5
    IC=SUMC(I)
    IF(I.EQ.N1) IAREA=ISUM
    IF(I.EQ.N1.AND.ISUM.LT.PEAKC) ISUM=PEAKC
    IF(I.EQ.N1.AND.ISUM.LT.PEAKB) ISUM=PEAKB

460 MN=MON(I)
    IDA=DAY(I)
    NDAY=DAYS
    IL=SUML(I)
    IF(K.EQ.3) ISUM=PEAKL
    IF(I.EQ.N1.AND.ISUM.LT.PEAKL) ISUM=PEAKL

CxXXXXX THE FOLLOWING IS USED ONLY
CxXXXXX WHEN ESTIMATING ESCAPEMENT THRU 9/15
CxXXXXX OR LAST SURVEY IF COUNTS = 0
CxXXXXX IF LAST SURVEY = 0 (ISW=0), THEN GO DIRECTLY TO PRINT
CxXXXXX IF (ISW.EQ.0) GO TO 580

C.....IF LAST SURVEY > 0 (ISW=1), SAVE OUTPUT,
C.....DON'T PRINT OUTPUT FOR 9/15 (WHICH IS ASSUMED TO BE ZERO)
C.....INSTEAD PRINT LAST ACTUAL SURVEY PLUS TOTAL ESCAPEMENT

CxXXXXX IF (I.EQ.N1) GO TO 570
CxXXXXX ISAV1=MN
CxXXXXX ISAV2=IDA
CxXXXXX ISAV3=NDAY
CxXXXXX ISAV4=IL
CxXXXXX ISAV5=IC
CxXXXXX ISAV6=IA
CxXXXXX SAV7=FOOTNOTE(I,1)
CxXXXXX SAV8=FOOTNOTE(I,2)
CxXXXXX IF (I.EQ.N) GO TO 590
Cx570x MN=ISAV1
CxXXXXX IDA=ISAV2
CxXXXXX NDAY=ISAV3
CxXXXXX IL=ISAV4
CxXXXXX IC=ISAV5
CxXXXXX IA=ISAV6
CxXXXXX FOOTNOTE(I,1)=SAV7
CxXXXXX FOOTNOTE(I,2)=SAV8

    IF(K.NE.3) GO TO 580
C.....OUTPUT FOR SOCKEYE DAILY GROUND SURVEY ESCAPEMENT SUMMARIES
    IF(I.LT.N1) WRITE(2,3000) MN, IDA, NDAY, IL, FOOTNOTE(I,1), FOOTNOTE(I,2)
3000 FORMAT (I2,'/',I2,3X,2I9,9X,2(1X,A25))
    IF(I.EQ.N1) WRITE(2,3003) MN, IDA, NDAY, IL, ISUM
    &, FOOTNOTE(I,1), FOOTNOTE(I,2)
3003 FORMAT (I2,'/',I2,3X,3I9,2(1X,A25))
    GO TO 585

C.....OUTPUT FOR PINK AND CHUM DAILY GROUND SURVEY ESCAPEMENT SUMMARIES
580 IF(I.LT.N1) WRITE(2,3004) MN, IDA, NDAY, IL, IC, IA
    &, FOOTNOTE(I,1), FOOTNOTE(I,2)
3004 FORMAT (I2,'/',I2,3X,4I9,9X,2(1X,A25))
    IF(I.EQ.N1) WRITE(2,3005) MN, IDA, NDAY, IL, IC, IA, ISUM

```

```

    &, FOOTNOTE(I,1), FOOTNOTE(I,2)
3005 FORMAT (I2,'/',I2,3X,5I9,2(1X,A25))

C.....OUTPUT FOR INSEASON DAILY RUN SUMMARY PROGRAMS
585 IF(I.LT.N1)WRITE(3,3200) TSAV,CSAV,ICODE(K),MN,IDA,IL
    &, FOOTNOTE(I,1), FOOTNOTE(I,2)
3200 FORMAT(A20,I4,1X,I2,I2,1X,I2,I9,9X,2(1X,A25))
    IF(I.EQ.N1)WRITE(3,3205) TSAV,CSAV,ICODE(K),MN,IDA,IL,ISUM
    &, FOOTNOTE(I,1), FOOTNOTE(I,2)
3205 FORMAT(A20,I4,1X,I2,I2,1X,I2,2I9,2(1X,A25))

C.....SKIP IF NO LIVE COUNTS
    IF(ISUM.EQ.0) GO TO 590

    IF(I.EQ.N1.AND.ISUM.EQ.PEAKL) WRITE(2,3400) IAREA
3400 FORMAT(' NOTE: peak live count used instead of area under curve (
    &',I9,')')
    IF(I.EQ.N1.AND.ISUM.EQ.PEAKC) WRITE(2,3500) IAREA
3500 FORMAT(' NOTE: peak carcass count used instead of area under',
    & ' curve (' ,I9,')')
    IF(I.EQ.N1.AND.ISUM.EQ.PEAKB) WRITE(2,3600) IPBM,IPBD,IAREA
3600 FORMAT(' NOTE: ',I2,'/',I2,' live + carcass counts used instead',
    & ' of area under curve (' ,I9,'')

590 CONTINUE
600 IPASS=0
N=2
DO 650 L=1,90
SUML(L)=0
SUMC(L)=0
DO 650 M=1,2
FOOTNOTE(L,M)='
650 CONTINUE
TOTAL=0
IF(ISTOP.EQ.0) GO TO 90
700 CONTINUE
WRITE(*,4000)
4000 FORMAT(/,' printout of escapement is in file named GROUND.ESC',/)
CALL STREAM
STOP
END
SUBROUTINE STREAM
C.....WRITE TABLE OF STREAM COUNTS BY SPECIES AND TIDE ZONE
C.....FOR DAILY BULLETIN BOARD UPDATES
    IMPLICIT DOUBLE PRECISION (A-H)
    IMPLICIT DOUBLE PRECISION (O-Z)
    CHARACTER*25 FOOTNOTE(90,2),FNOTE
    CHARACTER*20 TEXT,BLANK,TSAV
    CHARACTER*1 BLOCK(10,16)
    INTEGER SCODE,MON(90),DAY(90)
    DIMENSION PINK(90,2),CHUM(90,2),RED(90,2)
    DATA BLANK//'          '/

    REWIND(1)
    OPEN (4,FILE='STREAM.TAB')
    WRITE(4,2400)
2400 FORMAT('Summary of Ground Survey Counts',///,156('--'),/,
&20X,'pink',26X,'chum',24X,'sockeye',/,5X,3(1X,32('--')),//,
    &' date',3(' intertidal      stream      total'),' comments:',/,,
    &156('--'))
C.....SKIP FIRST 8 LINES
    DO 80 ISKIP=1,8

```

```

READ(1,2000)
80 CONTINUE
ISTOP=0
90 IPASS=0
DO 95 IN=1,90
DO 95 IZ=1,2
PINK(IN,IZ)=0
CHUM(IN,IZ)=0
RED(IN,IZ)=0
FOOTNOTE(IN,IZ)=''
95 CONTINUE
N=1
C.....DATA1 = PINK, DATA2 = CHUM, DATA3 = SOCKEYE
100 READ(1,2000,END=290) TEXT,SCODE,IM,ID,IZN,DATA1,DATA2,DATA3,FNOTE
2000 FORMAT(BZ,A20,I4,2I3,I2,3(F7.0,7X),1X,A25)

C.....SUMMARIZE STREAM DATA IF BLANK LINE AND DATA PRESENT
IF(TEXT.EQ.BLANK.AND.IPASS.EQ.1) GO TO 300
C.....SKIP IF 2 OR MORE BLANK LINES
IF(TEXT.EQ.BLANK.AND.IPASS.EQ.0) GO TO 100
C.....SKIP IF NO DATE
IF(IM.EQ.0.AND.ID.EQ.0) GO TO 100
C.....SKIP NEGATIVE NUMBERS
IF(DATA1.LT.0.OR.DATA2.LT.0) GO TO 100
WRITE(*,2050) TEXT,IM,ID,IZN
2050 FORMAT('+',A20,3I4,' subroutine stream')

C.....PROCESS ONLY ONE STREAM AT A TIME
IF(IPASS.EQ.1) GO TO 101
TSAV=TEXT
IDATE=(IM*100)+ID
IDSAV=IDATE
MON(N)=IM
DAY(N)=ID
IPASS=1
101 IF(TEXT.EQ.TSAV) GO TO 102
GO TO 300

C.....ASSIGN DAY NUMBERS TO COUNTS
102 IDATE=(IM*100)+ID
IF(IDATE.EQ.IDSAV) GO TO 103
N=N+1
IDSAV=IDATE
MON(N)=IM
DAY(N)=ID
103 PINK(N,IZN)=PINK(N,IZN)+DATA1
CHUM(N,IZN)=CHUM(N,IZN)+DATA2
RED(N,IZN)=RED(N,IZN)+DATA3
FOOTNOTE(N,IZN)=FNOTE
GO TO 100

290 ISTOP=1
300 WRITE(4,2100) TSAV
2100 FORMAT(/,A20,/)

DO 370 IN=1,N
SUMP=PINK(IN,1)+PINK(IN,2)
SUMC=CHUM(IN,1)+CHUM(IN,2)
SUMR=RED(IN,1)+RED(IN,2)
CALL COMMAS(PINK(IN,1),BLOCK,1,0,1)
CALL COMMAS(PINK(IN,2),BLOCK,2,0,1)
CALL COMMAS(SUMP,BLOCK,3,0,1)

```

```

CALL COMMAS (CHUM(IN,1),BLOCK,4,0,1)
CALL COMMAS (CHUM(IN,2),BLOCK,5,0,1)
CALL COMMAS (SUMC,BLOCK,6,0,1)
CALL COMMAS (RED(IN,1), BLOCK,7,0,1)
CALL COMMAS (RED(IN,2), BLOCK,8,0,1)
CALL COMMAS (SUMR,BLOCK,9,0,1)
WRITE(4,3000) MON(IN),DAY(IN)
&, (BLOCK(IM,1),IM=1,10),(BLOCK(IM,2),IM=1,10)
&, (BLOCK(IM,3),IM=1,10),(BLOCK(IM,4),IM=1,10)
&, (BLOCK(IM,5),IM=1,10),(BLOCK(IM,6),IM=1,10)
&, (BLOCK(IM,7),IM=1,10),(BLOCK(IM,8),IM=1,10)
&, (BLOCK(IM,9),IM=1,10)
&, FOOTNOTE(IN,1),FOOTNOTE(IN,2)
3000 FORMAT (I2,'/',I2,9(1X,10A1)2(1X,A25))
370 CONTINUE

TOTAL=0
IF(ISTOP.EQ.0) GO TO 90
WRITE(*,4000)
4000 FORMAT(/,' printout of stream counts by tide zone',
&' is in file named STREAM.TAB',/)
STOP
END
SUBROUTINE COMMAS(ANO,BLOCK,J,IDECK,ICOM)
C.....INSERT COMMAS INTO A NUMBER
C W/ APPROPRIATE NUMBER OF DECIMAL PLACES
C LARGEST NUMBER W/ 0 DECIMAL PLACES IS 99,999,999
C LARGEST NUMBER W/ 9 DECIMAL PLACES IS .999999999
C RETURN A BLANK '' IF NUMBER < 0 (NEGATIVE)
C IDEC = NUMBER OF DECIMAL PLACES
C IF ICOM = 1 THEN ADD COMMAS, IF ICOM = 0, THEN NO COMMAS
IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
CHARACTER*1 D(12),BLOCK(10,16)
LOGICAL POSIT
DATA D/'0','1','2','3','4','5','6','7','8','9','.',',' '/
C.....FILL ENTIRE ARRAY W/ BLANKS
DO 5 I=1,10
BLOCK(I,J)=D(12)
5 CONTINUE
C.....IF NUMBER < 0 (i.e. NEGATIVE), THEN RETURN BLANK ARRAY
IF(ANO.LT.0) RETURN
C.....SHIFT DECIMAL PLACE
AN=ANO*10**IDECK
C.....ROUND UP
AN=AN+.5
C.....IF NEGATIVE NUMBER, CONVERT TO POSITIVE
POSIT=.TRUE.
IF(AN.GE.0) GO TO 10
POSIT=.FALSE.
AN=-AN
10 IF(ICOM.EQ.0) GO TO 15
C.....POSITION OF COMMAS IN ARRAY DEPENDS ON DECIMAL PLACE
N1=3
N2=7
IF(IDECK.EQ.0) GO TO 15
N1=3-IDECK
N2=7-IDECK
C.....DIVIDE AND FIND REMAINDER
15 L=11
DEM=10.0
DO 30 I=1,10

```

```

REM=DMOD (AN, DEM)
M=IFIX (REM)
L=L-1
C.....INSERT COMMAS
IF (ICOM.EQ.0) GO TO 20
IF (.NOT. (L.EQ.N1.OR. L.EQ.N2)) GO TO 20
BLOCK(L,J)=' , '
L=L-1
C.....CONVERT TO CHARACTER STRING
20 K=M+1
BLOCK(L,J)=D(K)
AN=AN/10.0
IF (AN.LT.1.0) GO TO 40
30 CONTINUE
40 IF (L.EQ.1) GO TO 50
L=L-1
IF (POSIT) GO TO 50
BLOCK(L,J)=' - '
C.....INSERT DECIMAL PLACE
50 IF (IDEC.EQ.0) RETURN
ID=10-IDEC
DO 100 I=2, ID
K=I-1
BLOCK(K,J)=BLOCK(I,J)
100 CONTINUE
BLOCK(ID,J)=D(11)
C.....RESTORE LEADING ZEROS
ID1=ID
DO 110 I=ID1, 10
IF (BLOCK(I,J).EQ.' ') BLOCK(I,J)=' 0'
110 CONTINUE
RETURN
END

```

Appendix P. Source code for FORTRAN program UPDATE.EXE.

```

$DEBUG
C.....READ CATCH, WEIR, GROUND AND AERIAL SURVEY DATA
C.....WEIR IS SOCKEYE ONLY
C.....READ LOCATION CODES AND MATCHING NAMES FILE
C.....(1) WRITE DAILY RUN SUMMARY FOR LOWER COOK INLET
C.....(2) PUT TOTAL RUN INTO PERSPECTIVE W/ MEAN ACCUM CATCH AND ESC
C.....(3) INTERPRET DATA WITH PREDICTED TOTAL RUN

C.....FISHING DISTRICTS AND SPAWNING STREAMS ARE LISTED IN SAME ORDER
C.....AS IN FILE CODES.LCI
C.....BREAK AFTER THE FOLLOWING FOR DISTRICT CHANGE: 12,26,30
C.....TO FIND BREAKS, SEARCH FOR THE STRING 'L.EQ.'

IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
DIMENSION CAT(5)
DIMENSION CATCH(42,2), GROUND(42,12,2), AERIAL(42,12,3), WEIR(42,12)
CHARACTER*28 STREAM(42,12)
CHARACTER*25 FNOTE, FOOTNOTE(60), BLANK
CHARACTER*22 AREA(42), TEXT
CHARACTER*12 FNAME
CHARACTER*7 SPECIES(5)
CHARACTER*2 AM2, AM3, AM4, AD2, AD3, AD4
CHARACTER*1 ANUM(10,14), FCODE, S2, S3, S4
INTEGER LDAC(42), LDAK(42,12), LDAA(42,12), LDAW(42,12)
INTEGER SCODE(42,12)
INTEGER NSTRM(42)
INTEGER ACODE(42), CODE, IT(15), DCODE
COMMON SCODE, STREAM, ACODE, AREA
COMMON /L/NSTRM
DATA SPECIES/'CHINOOK','SOCKEYE','    COHO','    PINK','    CHUM'/
DATA BLANK/'

C.....CLEAR PORT DICK TOTALRUN
PTDK=0

      WRITE(*,1300)
1300 FORMAT('/', ' 41 = chinook', '/',
     &           ' 42 = sockeye', '/',
     &           ' 43 = coho', '/',
     &           ' 44 = pink', '/',
     &           ' 45 = chum   ', \)
      READ(*,1400) KIND
1400 FORMAT(I2)
IS=KIND-40

      WRITE(*,1410)
1410 FORMAT('/', ' 1 = inseason report w/ dates, most recent & ',
     & 'accum data', '/',
     &           ' 2 = postseason report w/ totals only   ', \)
      READ(*,1400) JSW
C.....
C.....FIND LATEST DATE AMONG ALL DATA FILES
C.....
      WRITE(*,1420)
1420 FORMAT(/' searching for most recent catch & survey dates')
      LDATE=0101

      OPEN(1,FILE='CATCH.    ')
100 CALL VREAD(1,1,16,IT,IERR,IEND)

```

```

IF(IEND.EQ.1) GO TO 120
IDATE=IT(5)
IF(IDATE.GT.LDATE) LDATE=IDATE
GO TO 100

120 OPEN(2,FILE='GROUND.    ')
140 READ(2,2200,END=150) ICODE,ISP,M,ID
IF(ISP.NE.KIND) GO TO 140
IDATE=M*100+ID
IF(IDATE.GT.LDATE) LDATE=IDATE
GO TO 140

150 OPEN(3,FILE='AERIAL.    ')
160 READ(3,2300,END=200) ICODE,ISP,M,ID
IDATE=M*100+ID
IF(IDATE.GT.LDATE) LDATE=IDATE
GO TO 160

200 IF(KIND.EQ.42) THEN
OPEN(8,FILE='WEIR.PRN')
205 READ(8,2285,END=206) ICODE,M,ID
IDATE=M*100+ID
IF(IDATE.GT.LDATE) LDATE=IDATE
GO TO 205
ENDIF

206 REWIND 1
REWIND 2
REWIND 3
IF(KIND.EQ.42)REWIND 8
CALL READCODE

C.....LIST FISHERY, STREAM, AND CODES
C DO 209 L=1,42
C WRITE(*,1500) ACODE(L),AREA(L),L
C1500 FORMAT(' ',I6,A22,6X,I6)
C DO 208 M=1,12
C IF(M.GT.NSTRM(L)) GO TO 992
C WRITE(*,1600) SCODE(L,M),STREAM(L,M),L,M
C1600 FORMAT(' ',2X,I4,A28,2I6)
C 208 CONTINUE
C 209 CONTINUE

C.....INITIALIZE MOST RECENT DATE AS 1/1

LDAW=101

C.....ZERO OUT ACCUM

DO 210 L=1,42
LDAC(L)=101
DO 210 M=1,12
LDAA(L,M)=101
LDAG(L,M)=101
IF(KIND.EQ.42) THEN
LDAW(L,M)=101
WEIR(L,M)=0
ENDIF
DO 210 N=1,3
AERIAL(L,M,N)=0
IF(N.EQ.3) GO TO 210
CATCH(L,N)=0

```

```

GROUND (L, M, N) =0
210 CONTINUE

C......
C.....READ CATCH DATA
C......
NX=1
WRITE (*,1700)
1700 FORMAT (' reading catch data')
220 CALL VREAD (NX,1,16,IT,IERR,IEEND)
IF (IEEND.EQ.1) GOTO 290
CODE=IT(3)
IDATE=IT(5)
CAT(1)=IT(7)
CAT(2)=IT(9)
CAT(3)=IT(11)
CAT(4)=IT(13)
CAT(5)=IT(15)
NX=NX+1
CALL AREANO (CODE,L,ICHK)
IF (ICHK.EQ.1) GO TO 220

C.....ACCUM CATCH BY FISHERY ONLY
C.....LATER, READ CATCH FILE AGAIN AND
C.....FIND TOTAL CATCH FOR LAST DAY FOR ALL GEAR TYPES AND DELIVERIES

IF (IDATE.GT.LDAC(L)) LDAC(L)=IDATE
CATCH(L,2)=CATCH(L,2)+CAT(IS)
GO TO 220

C......
C.....READ GROUND SURVEY DATA
C......

290 NF=0
WRITE (*,2100)
2100 FORMAT (' reading ground survey data')
300 READ (2,2200,END=390) ICODE,ISP,MO,ID,RAW1,RAW2,FNOTE
2200 FORMAT (20X,I4,I3,I2,I3,2F9.0,1X,A25)
IF (ISP.NE.KIND) GO TO 300
CALL STRMNO (ICODE,L,M)
IDATE=(MO*100)+ID
IF (IDATE.GT.LDAG(L,M)) GROUND(L,M,1)=RAW1
IF (IDATE.GT.LDAG(L,M)) LDAG(L,M)=IDATE
GROUND(L,M,2)=RAW2
IF (FNOTE.EQ.BLANK) GO TO 300
NF=NF+1
FOOTNOTE (NF)=FNOTE
GO TO 300

C......
C.....READ AERIAL SURVEY DATA
C......

390 WRITE (*,2250)
2250 FORMAT (' reading aerial survey data')
400 READ (3,2300,END=505) ICODE,ISP,MO,ID,RAW1,RAW2,RAW3
2300 FORMAT (22X,I4,I3,I2,I3,3F9.0)

IF (ISP.NE.KIND) GO TO 400
CALL STRMNO (ICODE,L,M)
IDATE=(MO*100)+ID
IF (IDATE.GT.LDAA(L,M)) AERIAL(L,M,1)=RAW1
IF (IDATE.GT.LDAA(L,M)) LDAA(L,M)=IDATE

```

```

AERIAL(L,M,2) =RAW2
AERIAL(L,M,3) =RAW3
GO TO 400

C.....
C.....READ WEIR DATA
C.....
505 IF(KIND.EQ.42) THEN
  WRITE(*,2275)
2275 FORMAT(/' reading weir daily counts')
  READ(8,2285,END=510) ICODE,MO,ID,RAW1
2285 FORMAT(28X,I4,I2,I3,F9.0)

  CALL STRMNO(ICODE,L,M)
  IDATE=(MO*100)+ID
C.....FIND ACCUM WEIR COUNTS FROM DAILY WEIR COUNTS
  WEIR(L,M)=WEIR(L,M)+RAW1
  IF(IDATE.GT.LDAW(L,M)) LDAW(L,M)=IDATE
  GO TO 506
  ENDIF

C.....READ CATCH FILE AGAIN AND
C.....FIND TOTAL CATCH FOR LAST DAY FOR ALL GEAR TYPES AND DELIVERIES

510 REWIND 1
  NX=1
  WRITE(*,2400)
2400 FORMAT(/' calculating total catch by gear type and delivery')
  520 CALL VREAD(NX,1,16,IT,IERR,IEEND)
    IF(IEND.EQ.1) GO TO 560
    CODE=IT(3)
    IDATE=IT(5)
    CAT(1)=IT(7)
    CAT(2)=IT(9)
    CAT(3)=IT(11)
    CAT(4)=IT(13)
    CAT(5)=IT(15)
    NX=NX+1
    CALL AREANO(CODE,L,ICHK)
    IF(ICHK.EQ.1) GO TO 520
    IF(IDATE.NE.LDAC(L)) GOTO 520
    CATCH(L,1)=CATCH(L,1)+CAT(IS)
    GO TO 520

C.....
C.....PRINT DAILY RUN SUMMARY
C.....
560 WRITE(*,2500)
2500 FORMAT(/, ' TOTAL RUN OUTPUT FILENAME? ')
  READ(*,2550) FNAME
2550 FORMAT(A12)
  OPEN(5,FILE=FNAME)

  IF(JSW.EQ.2.OR.KIND.EQ.41) GO TO 563
  WRITE(*,2570)
2570 FORMAT(/, ' HISTORICAL AND PREDICTED TOTAL RUN OUTPUT FILENAME? ')
  READ(*,2550) FNAME
  OPEN(7,FILE=FNAME)

563 CALL GETDAT (NYR,NMO,NDA)
  CALL GETTIM (NH,NM,NS,NHS)
  WRITE(5,2600) NMO,NDA,NYR,NH,NM,NS

```

```

2600 FORMAT(I2,'/',I2,'/',I4,' ',I2,':',I2,':',I2)
  IF(JSW.EQ.1.AND.KIND.NE.41) WRITE(7,2600) NMO,NDA,NYR,NH,NM,NS
  MO1=LDATE/100
  ID1=LDATE-(MO1*100)
  MO2=0
  MO3=0
  MO4=0
  ID2=0
  ID3=0
  ID4=0
  IS=KIND-40

  IF(JSW.EQ.1) WRITE(5,2700) SPECIES(IS),MO1,ID1,NYR
2700 FORMAT( /,'Table 1. Preliminary Lower Cook Inlet ',A7,' '
  &,'salmon daily run summary thru ',I2,'/',I2,'/',I4,/)
  IF(JSW.EQ.1.AND.KIND.NE.41) WRITE(7,2725) SPECIES(IS),MO1,ID1,NYR
2725 FORMAT( /,'Table 2. Accum ',A7,' catch and escapement ',
  &,' historical mean, & predicted total run size, '
  &,'I2,'/,I2,'/',I4,/)
  564 IF(JSW.EQ.2) WRITE(5,2750) SPECIES(IS),NYR
2750 FORMAT( /,'Table 1. Preliminary Lower Cook Inlet ',A7,' '
  &,'salmon total run summary, ',I4,)

  IF(JSW.EQ.1) THEN
    IF(KIND.NE.42) WRITE(5,2800)
2800 FORMAT(114(' '))
    IF(KIND.EQ.42) WRITE(5,2850)
2850 FORMAT(129(' '))
    IF(KIND.NE.41) WRITE(7,2900)
2900 FORMAT(94(' '))
    ENDIF
    IF(JSW.EQ.2) WRITE(5,4200)
4200 FORMAT(60(' '))

C.....WRITE HEADINGS FOR INSEASON REPORT
  IF(JSW.EQ.1) THEN
    IF(KIND.NE.42) WRITE(5,4300)
4300 FORMAT(
  &'          -----C A T C H----- -----G R O',
  &' U N D----- A E R I A L----- T O T A L '/',
  &'                      MOST                      MO',
  &' ST                         MOST                         R U N '/',
  &' FISHERY                     DATE             RECENT           ACCUM   DATE      REC',
  &' ENT           ACCUM   DATE     RECENT           PEAK           ') )
  IF(KIND.EQ.42) WRITE(5,4325)
4325 FORMAT(
  &'          -----C A T C H----- -----G R O',
  &' U N D----- A E R I A L----- WEIR----- T O ',
  &' T A L '/',
  &'                      MOST                      MO',
  &' ST                         MOST                         R ,
  &' U N  '/',
  &' FISHERY                     DATE             RECENT           ACCUM   DATE      REC',
  &' ENT           ACCUM   DATE     RECENT           PEAK           ') )
  IF(JSW.EQ.1.AND.KIND.NE.41) WRITE(7,4350)
4350 FORMAT(
  &'          MOST      ACCUM      AVERAGE      HISTORICAL',
  &' PREDICT TOTAL RUN '/',
  &'          RECENT    CATCH &    ACCUM TOTAL    SAMPLE  ,
  &'          '/',
  &' FISHERY                     DATE   ESCAPEMENT    RUN (%)      SIZE  ,
  &' LOW        AVERAGE        HI')

```

```

        ENDIF
C.....WRITE HEADING FOR POSTSEASON REPORT
    IF (JSW.EQ.2) WRITE (5,4400)
4400 FORMAT(
    &'FISHERY'                                CATCH   ESCAPEMENT   TOTAL RUN')
                                               
        ALLC=0
        ALLG=0
        ALLA=0
        ALLW=0
        ALLR=0
        DO 690 L=1,42
        IF (L.EQ.1) GO TO 565
        IF (L.EQ.12) GO TO 565
        IF (L.EQ.26) GO TO 565
        IF (L.EQ.31) GO TO 565
        GO TO 566
565  DC=0
        DA=0
        DG=0
        DW=0
        DR=0

C.....WRITE DISTRICT NAME REGARDLESS WHETHER DATA PRESENT OR NOT

566 IF (JSW.EQ.1) THEN
    IF (KIND.NE.42) THEN
        IF (L.EQ.1) WRITE (5,2800)
        IF (L.EQ.12) WRITE (5,2800)
        IF (L.EQ.26) WRITE (5,2800)
        IF (L.EQ.31) WRITE (5,2800)
    ENDIF
    IF (KIND.EQ.42) THEN
        IF (L.EQ.1) WRITE (5,2850)
        IF (L.EQ.12) WRITE (5,2850)
        IF (L.EQ.26) WRITE (5,2850)
        IF (L.EQ.31) WRITE (5,2850)
    ENDIF
    IF (KIND.EQ.41) GO TO 567
    IF (L.EQ.1) WRITE (7,2900)
    IF (L.EQ.12) WRITE (7,2900)
    IF (L.EQ.26) WRITE (7,2900)
    IF (L.EQ.31) WRITE (7,2900)
ENDIF

567 IF (JSW.EQ.2) THEN
    IF (L.EQ.1) WRITE (5,4200)
    IF (L.EQ.12) WRITE (5,4200)
    IF (L.EQ.26) WRITE (5,4200)
    IF (L.EQ.31) WRITE (5,4200)
ENDIF
    IF (L.EQ.1) WRITE (5,4500)

4500 FORMAT( /,'SOUTHERN DISTRICT',/)
    IF (L.EQ.12) WRITE (5,4600)
4600 FORMAT( /,'OUTER DISTRICT',/)
    IF (L.EQ.26) WRITE (5,4700)
4700 FORMAT( /,'EASTERN DISTRICT',/)
    IF (L.EQ.31) WRITE (5,4800)
4800 FORMAT( /,'KAMISHAK DISTRICT',/)
    IF (JSW.EQ.2.OR.KIND.EQ.41) GO TO 568
    IF (L.EQ.1) WRITE (7,4500)
    IF (L.EQ.12) WRITE (7,4600)
    IF (L.EQ.26) WRITE (7,4700)

```

```

      IF(L.EQ.31) WRITE(7,4800)
568 TOTRUN=0.

C.....SUMMARIZE CATCH DATA ONLY IF CATCH > 0
      IF(CATCH(L,2).EQ.0) GO TO 570

      MO1=LDAC(L)/100
      ID1=LDAC(L)-(MO1*100)
      CALL COMMAS(CATCH(L,1),ANUM,1)
      CALL COMMAS(CATCH(L,2),ANUM,2)
      IF(JSW.EQ.1) WRITE(5,4900) AREA(L),MO1,ID1,
      &(ANUM(I,1),I=1,10),(ANUM(I,2),I=1,10)
4900 FORMAT(A22,1X,I2,'/',I2,20A1)
      IF(JSW.EQ.2) WRITE(5,5000) AREA(L),(ANUM(I,2),I=1,10)
5000 FORMAT(A22,4X,10A1)
      TOTRUN=TOTRUN+CATCH(L,2)
      DC=DC+CATCH(L,2)
      ALLC=ALLC+CATCH(L,2)
      DR=DR+CATCH(L,2)
      ALLR=ALLR+CATCH(L,2)

570 ISW=0
      DO 590 M=1,12
      IF(M.GT.NSTRM(L)) GO TO 590

C.....SUMMARIZE ESCAPEMENT DATA ONLY IF DATA AVAILABLE
C.....REGARDLESS OF DATE
      IF(KIND.EQ.42) THEN
      IF(GROUND(L,M,2).EQ.0.AND.AERIAL(L,M,2).EQ.0.AND.WEIR(L,M).EQ.0)
      &GO TO 590
      ENDIF
      IF(KIND.NE.42) THEN
      IF(GROUND(L,M,2).EQ.0.AND.AERIAL(L,M,2).EQ.0)
      &GO TO 590
      ENDIF

      ESC=GROUND(L,M,2)
C.....ESCAPEMENT = AERIAL IF AERIAL > GROUND
      IF(GROUND(L,M,2).LT.AERIAL(L,M,2)) ESC=AERIAL(L,M,2)
C.....WEIR COUNTS TAKE PRECEDENCE OVER AERIAL AND GROUND
      IF(KIND.EQ.42.AND.WEIR(L,M).GT.0) ESC=WEIR(L,M)
C.....BAY FISH FROM END OF SEASON
      BAY=AERIAL(L,M,3)
C.....TOTAL RUN = CATCH + ESCAPEMENT + BAY FISH
      TOTRUN=TOTRUN+ESC+BAY
      DG=DG+GROUND(L,M,2)
      DA=DA+AERIAL(L,M,2)+AERIAL(L,M,3)
      DR=DR+ESC+BAY
      IF(KIND.EQ.42) DW=DW+WEIR(L,M)
      ALLG=ALLG+GROUND(L,M,2)
      ALLA=ALLA+AERIAL(L,M,2)+AERIAL(L,M,3)
      ALLR=ALLR+ESC+BAY
      IF(KIND.EQ.42) ALLW=ALLW+WEIR(L,M)

C.....IF NO CATCH, THEN WRITE FISHERY NAME ONLY

      IF(CATCH(L,2).EQ.0.AND.ISW.EQ.0) WRITE(5,4900) AREA(L)
      MO2=LDAG(L,M)/100
      ID2=LDAG(L,M)-(MO2*100)
      MO3=LDAA(L,M)/100
      ID3=LDAA(L,M)-(MO3*100)
      MO4=LDAW(L,M)/100

```

```

ID4=LDAW(L,M) - (MO4*100)

IF (JSW.EQ.2) GO TO 587

CALL COMMAS(GROUND(L,M,1),ANUM,3)
CALL COMMAS(GROUND(L,M,2),ANUM,4)
CALL COMMAS(AERIAL(L,M,1),ANUM,5)
CALL COMMAS(AERIAL(L,M,2),ANUM,6)
IF(KIND.EQ.42) CALL COMMAS(WEIR(L,M),ANUM,7)

IF(GROUND(L,M,2).GT.0) THEN
WRITE(AM2,5050) MO2
WRITE(AD2,5050) ID2
5050 FORMAT(I2)
S2='/'
ELSE
AM2=' '
AD2=' '
S2=' '
ENDIF

IF(AERIAL(L,M,2).GT.0) THEN
WRITE(AM3,5050) MO3
WRITE(AD3,5050) ID3
S3='/'
ELSE
AM3=' '
AD3=' '
S3=' '
ENDIF

IF(WEIR(L,M).GT.0) THEN
WRITE(AM4,5050) MO4
WRITE(AD4,5050) ID4
S4='/'
ELSE
AM4=' '
AD4=' '
S4=' '
ENDIF

C.....INSEASON REPORT (SURVEY AND WEIR RESULTS)
IF(KIND.NE.42) THEN
WRITE(5,5100) STREAM(L,M),
&AM2,S2,AD2,(ANUM(I,3),I=1,10),(ANUM(I,4),I=1,10),
&AM3,S3,AD3,(ANUM(I,5),I=1,10),(ANUM(I,6),I=1,10)
ENDIF
IF(KIND.EQ.42) THEN
WRITE(5,5100) STREAM(L,M),
&AM2,S2,AD2,(ANUM(I,3),I=1,10),(ANUM(I,4),I=1,10),
&AM3,S3,AD3,(ANUM(I,5),I=1,10),(ANUM(I,6),I=1,10),
&AM4,S4,AD4,(ANUM(I,7),I=1,10)
5100 FORMAT(3X,A28,17X,1X,A2,A1,A2,20A1,
&1X,A2,A1,A2,20A1,1X,A2,A1,A2,10A1)
ENDIF

C.....BAY FISH (INSEASON REPORT)
IF(AERIAL(L,M,3).EQ.0) GO TO 575
CALL COMMAS(AERIAL(L,M,3),ANUM,14)

WRITE(5,5375)(ANUM(I,14),I=1,10)
5375 FORMAT(3X,'Fish still in bay during last survey',51X,10A1)

```

```

575 ISW=1
GO TO 590

C.....FOR POST SEASON REPORT, USE ESCAPEMENT ONLY
C.....THE GREATER OF GROUND OR AERIAL
587 CALL COMMAS(ESC,ANUM,4)
WRITE(5,5400) STREAM(L,M),(ANUM(I,4),I=1,10)
5400 FORMAT(3X,A28,7X,10A1)
C.....BAY FISH (POST SEASON REPORT)
IF(AERIAL(L,M,3).EQ.0) GO TO 588
CALL COMMAS(AERIAL(L,M,3),ANUM,14)
WRITE(5,5450)(ANUM(I,14),I=2,10)
5450 FORMAT(3X,'Fish still in bay during last survey',9A1)

588 ISW=1
590 CONTINUE

CALL COMMAS(TOTRUN,ANUM,9)
C.....MEAN ACCUM % FOR INSEASON REPORT
PREDLO=0
PRED=0
PREDHI=0
IF(JSW.EQ.2) GO TO 596
IF(KIND.EQ.41) GO TO 596
CLOSE(4)
IF(KIND.EQ.42)OPEN(4,FILE='RUNTIME.RED')
IF(KIND.EQ.43)OPEN(4,FILE='RUNTIME.CHO')
IF(KIND.EQ.44)OPEN(4,FILE='RUNTIME.PNK')
IF(KIND.EQ.45)OPEN(4,FILE='RUNTIME.CHM')
C.....FIND THE LATEST DATE AMONG CATCH AND ESCAPEMENT
LATEST=(M01*100)+ID1
ITEMP=(M02*100)+ID2
IF(ITEMP.GT.LATEST) LATEST=ITEMP
ITEMP=(M03*100)+ID3
IF(ITEMP.GT.LATEST) LATEST=ITEMP

C.....LUMP ALL OF PORT DICK INTO ONE
C.....FOR HISTORICAL MEAN AND PREDICTED TOTAL RUN
IF(L.GE.17.AND.L.LE.20) PTDK=PTDK+TOTRUN
C.....SKIP INDIVIDUAL PRINTOUT OF HISTORICAL MEAN AND PREDICTED TOTAL RUN
C.....FOR ENTRANCE, SOUTH SECTION, & TAYLOR BAY
IF(L.GE.17.AND.L.LE.19) GO TO 598

C.....FIND MEAN ACCUM % TOTAL RUN
REWIND 4
PCT=0
NSAMP=0
591 READ(4,5500,END=596) FCODE,TEXT
5500 FORMAT(A1,A22)
C.....SEARCH FOR CORRECT FISHERY NAME
IF(FCODE.NE.'*') GO TO 591
READ(TEXT,5600) DCODE
5600 FORMAT(I5,17X)
IF(ACODE(L).NE.DCODE)GO TO 591
C.....SKIP 1ST HEADER RECORD
READ(4,5700,END=596)
C.....READ DATA RECORDS
592 READ(4,5700,END=596) FCODE,TEXT
5700 FORMAT(1X,A1,A22)
C.....END OF DATA RECORDS IF 2ND HEADER RECORD FOUND
IF(FCODE.NE.' ')GO TO 596
READ(TEXT,5750)M05, ID5, PLO, PCT, PHI, NSAMP

```

```

5750 FORMAT(I1,1X,I2,3F5.2,I3)
ITEMP=(M05*100)+ID5
C.....USE THE LATEST DATA UNLESS SUPERCEDED BY MORE RECENT DATA
IF(PHI.GT.0) PREDLO=TOTRUN/PHI
IF(PCT.GT.0) PRED=TOTRUN/PCT
IF(PLO.GT.0) PREDHI=TOTRUN/PLO
C.....PORT DICK HISTORICAL MEAN AND PREDICTED TOTAL RUN ONLY
IF(L.EQ.20.AND.PHI.GT.0) PREDLO=PTDK/PHI
IF(L.EQ.20.AND.PCT.GT.0) PRED=PTDK/PCT
IF(L.EQ.20.AND.PLO.GT.0) PREDHI=PTDK/PLO
IF(ITEMP.LT.LATEST) GO TO 592

C.....SUM OF CATCH AND GREATER OF AERIAL OR GROUND
C.....REGARDLESS OF DATE

596 CALL COMMAS(PREDLO,ANUM,10)
CALL COMMAS(PRED,ANUM,11)
CALL COMMAS(PREDHI,ANUM,12)
MM=LATEST/100
MD=MOD(LATEST,100)
C.....SKIP IF TOTAL RUN = 0
IF(TOTRUN.EQ.0) GO TO 598
C.....SKIP IF NO RUN TIME DATA
IF(NSAMP.EQ.0) GO TO 598
IF(L.EQ.20) GO TO 597
IF(JSW.EQ.1.AND.KIND.NE.41) WRITE(7,5900) AREA(L),MM,MD,
&(ANUM(I,9),I=1,10),PCT,NSAMP,
&(ANUM(I,10),I=1,10),(ANUM(I,11),I=1,10),(ANUM(I,12),I=1,10)
5900 FORMAT(A22,1X,I1,'/',I2,1X,10A1,1X,F9.2,9X,I3,2X,30A1)
GO TO 598

C.....PORT DICK HISTORICAL MEAN AND PREDICTED TOTAL RUN ONLY
597 CALL COMMAS(PTDK,ANUM,13)
AREA(L)='Port Dick (combined)'
IF(KIND.EQ.41) GO TO 598
IF(JSW.EQ.1.AND.PTDK.GT.0) WRITE(7,5920) AREA(L),MM,MD,
&(ANUM(I,13),I=1,10),PCT,NSAMP,
&(ANUM(I,10),I=1,10),(ANUM(I,11),I=1,10),(ANUM(I,12),I=1,10)
5920 FORMAT(A22,1X,I1,'/',I2,1X,10A1,1X,F9.2,9X,I3,2X,30A1)

598 IF(TOTRUN.GT.0) THEN
IF(JSW.EQ.1.AND.KIND.NE.42) WRITE(5,5950) (ANUM(I,9),I=1,10)
5950 FORMAT(6X,'Total Run',16X,17X,26X,26X,3X,10A1,1X,F9.2,30A1)
IF(JSW.EQ.1.AND.KIND.EQ.42) WRITE(5,5975) (ANUM(I,9),I=1,10)
5975 FORMAT(6X,'Total Run',16X,17X,26X,26X,3X,16X,10A1,1X,F9.2,30A1)
IF(JSW.EQ.2) WRITE(5,6000) (ANUM(I,9),I=1,10)
6000 FORMAT(6X,'Total Run',11X,12X,12X,10A1)
ENDIF
IF(L.EQ.11) GO TO 680
IF(L.EQ.25) GO TO 680
IF(L.EQ.30) GO TO 680
IF(L.EQ.42) GO TO 680
GO TO 690

C.....WRITE DISTRICT TOTALS

680 CALL COMMAS(DC,ANUM,2)
CALL COMMAS(DG,ANUM,4)
CALL COMMAS(DA,ANUM,6)
IF(KIND.EQ.42) CALL COMMAS(DW,ANUM,7)
CALL COMMAS(DR,ANUM,8)
IF(JSW.EQ.1) THEN

```

```

IF(KIND.NE.42) WRITE(5,6100)
&(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
&(ANUM(I,6),I=1,10), (ANUM(I,8),I=1,10)
6100 FORMAT(/, 'DISTRICT TOTAL', 8X, 16X, 10A1,
&16X, 10A1, 16X, 10A1, 3X, 10A1, /)
    IF(KIND.EQ.42) WRITE(5,6150)
    &(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
    &(ANUM(I,6),I=1,10), (ANUM(I,7),I=1,10), (ANUM(I,8),I=1,10)
6150 FORMAT(/, 'DISTRICT TOTAL', 8X, 16X, 10A1,
&16X, 10A1, 16X, 10A1, 6X, 10A1, 3X, 10A1, /)
    ENDIF
    ESC=DR-DC
    CALL COMMAS(ESC,ANUM,4)
    IF(JSW.EQ.2) WRITE(5,6200)
    &(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
    &(ANUM(I,8),I=1,10)
6200 FORMAT(/, 'DISTRICT TOTAL', 12X, 10A1,
&2X, 10A1, 2X, 10A1/)
690 CONTINUE
    IF(JSW.EQ.1.AND.KIND.NE.42) WRITE(5,2800)
    IF(JSW.EQ.1.AND.KIND.EQ.42) WRITE(5,2850)
    IF(JSW.EQ.1.AND.KIND.NE.41) WRITE(7,2900)
    IF(JSW.EQ.2) WRITE(5,4200)

```

C.....WRITE TOTAL FOR ALL OF LOWER COOK INLET

```

CALL COMMAS(ALLC,ANUM,2)
CALL COMMAS(ALLG,ANUM,4)
CALL COMMAS(ALLA,ANUM,6)
IF(KIND.EQ.42) CALL COMMAS(ALLW,ANUM,7)
CALL COMMAS(ALLR,ANUM,8)
IF(JSW.EQ.1) THEN
    IF(KIND.NE.42) WRITE(5,6300)
    &(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
    &(ANUM(I,6),I=1,10), (ANUM(I,8),I=1,10)
6300 FORMAT('TOTAL LOWER COOK INLET', 16X, 10A1,
&16X, 10A1, 16X, 10A1, 3X, 10A1)
    IF(KIND.EQ.42) WRITE(5,6350)
    &(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
    &(ANUM(I,6),I=1,10), (ANUM(I,7),I=1,10), (ANUM(I,8),I=1,10)
6350 FORMAT('TOTAL LOWER COOK INLET', 16X, 10A1,
&16X, 10A1, 16X, 10A1, 6X, 10A1, 3X, 10A1)
    ENDIF
    ESC=ALLR-ALLC
    CALL COMMAS(ESC,ANUM,4)
    IF(JSW.EQ.2) WRITE(5,6400)
    &(ANUM(I,2),I=1,10), (ANUM(I,4),I=1,10),
    &(ANUM(I,8),I=1,10)
6400 FORMAT('TOTAL LOWER COOK INLET', 4X, 10A1,
&2X, 10A1, 2X, 10A1)

    IF(JSW.EQ.1.AND.KIND.NE.42) WRITE(5,2800)
    IF(JSW.EQ.1.AND.KIND.EQ.42) WRITE(5,2850)
    IF(JSW.EQ.2) WRITE(5,4200)

    IF(JSW.EQ.2) WRITE(5,6500)
6500 FORMAT('note: final aerial survey may include bay fish')
    IF(NF.EQ.0) STOP
    DO 700 I=1,NF
        WRITE(5,6600) FOOTNOTE(I)
6600 FORMAT('          ',A25)
700 CONTINUE

```

```

STOP
END
SUBROUTINE COMMAS(ANO,ANUM,J)
C.....I N S E R T   C O M M A S   I N T O   A   N U M B E R
IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
CHARACTER *1 D(10),ANUM(10,14),BLANK
LOGICAL POSIT
DATA D/'0','1','2','3','4','5','6','7','8','9'/
DATA BLANK//'
DO 5 I=1,10
ANUM(I,J)=BLANK
5 CONTINUE
IF(ANO.EQ.0) RETURN
DEM=10.0
POSIT=.TRUE.
AN=ANO
IF(AN.GE.0) GO TO 10
POSIT=.FALSE.
AN=-AN
10 L=11
DO 30 I=1,10
REM=DMOD(AN,DEM)
M=IFIX(REM)
L=L-1
IF(.NOT.(L.EQ.3 .OR. L.EQ.7 )) GO TO 20
ANUM(L,J)=','
L=L-1
20 K=M+1
ANUM(L,J)=D(K)
AN=AN/10.0
IF(AN.LT.1.0)GO TO 40
30 CONTINUE
40 IF(L.EQ.1) RETURN
L=L-1
IF(POSIT) GO TO 50
ANUM(L,J)=' - '
50 RETURN
END
SUBROUTINE READCODE
C.....READ LIST OF STREAM AND STAT AREA CODES
C.....85 STREAM CODES, 42 STAT AREAS
IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
INTEGER NSTRM(42)
INTEGER SCODE(42,12),RAW1
CHARACTER*28 STREAM(42,12),RAW2
INTEGER ACODE(42),RAW3,SAVE
CHARACTER*22 AREA(42),RAW4
COMMON SCODE,STREAM,ACODE,AREA
COMMON /L/NSTRM
OPEN(6,FILE='CODES.LCI')
IPASS=0
100 READ(6,1000,END=900) RAW1,RAW2,RAW3,RAW4
1000 FORMAT(I4,1X,A28,1X,I5,1X,A22)
IF(IPASS.EQ.1) GO TO 200
M=1
N=1
SCODE(M,N)=RAW1
STREAM(M,N)=RAW2
ACODE(M)=RAW3
SAVE=RAW3

```

```

AREA (M) =RAW4
NSTRM (M) =1
IPASS=1
GO TO 100
200 IF (RAW3.EQ.SAVE) GO TO 300
N=1
M=M+1
SAVE=RAW3
ACODE (M) =RAW3
AREA (M) =RAW4
SCODE (M, N) =RAW1
STREAM (M, N) =RAW2
NSTRM (M) =N
GO TO 100
300 N=N+1
SCODE (M, N) =RAW1
STREAM (M, N) =RAW2
NSTRM (M) =N
GO TO 100
900 RETURN
END
SUBROUTINE STRMNO (ICODE, L, M)
C.....ASSIGN ARRAY NUMBER FROM STREAM CODE
IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
INTEGER SCODE (42,12)
CHARACTER*28 STREAM(42,12)
INTEGER ACODE (42)
CHARACTER*22 AREA (42)
COMMON SCODE, STREAM, ACODE, AREA
DO 300 L=1,42
DO 300 M=1,12
IF (ICODE.EQ.SCODE (L, M)) RETURN
300 CONTINUE
WRITE (*,1000) ICODE
1000 FORMAT (' STREAM CODE ',I4,' NOT VALID')
STOP
END
SUBROUTINE AREANO (CODE, L, ICHK)
C.....ASSIGN ARRAY NUMBER FROM STAT AREA CODE
C.....ICHK = 0, STAT AREA CODE VALID
C.....ICHK = 1, STAT AREA CODE NOT VALID
IMPLICIT DOUBLE PRECISION (A-H)
IMPLICIT DOUBLE PRECISION (O-Z)
INTEGER SCODE (42,12)
CHARACTER*28 STREAM(42,12)
INTEGER ACODE (42), CODE
CHARACTER*22 AREA (42)
COMMON SCODE, STREAM, ACODE, AREA
ICHK=0
DO 300 L=1,42
IF (CODE.EQ.ACODE (L)) RETURN
300 CONTINUE
WRITE (*,1000) CODE
1000 FORMAT (' STAT AREA CODE ',I5,' NOT VALID')
ICHK=1
RETURN
END
C
-----
SUBROUTINE VREAD (NREC, IUNIT, NVAR, IVAR, IERR, IEND)

```

```

C   Read the NRECth record from unit IUNIT           22 Mar 88 version
C   & check for the correct number of variables NVAR
C   & store variables in integer array IVAR

C   IERR=1 if error found
C   IEND=1 if end-of-file found
C   NV is the number of variables found

DIMENSION T(150),IVAR(50)
CHARACTER T*1

IEND=0
IERR=0
NV=0

READ(IUNIT,'(150A1)',END=300) (T(I),I=1,150)

C   Find LAST COLUMN which does not contain a comma or blank
DO 30 I=1,150
LAST=151-I
IF(T(LAST).NE.' ') GOTO 50
30 CONTINUE
WRITE(*,40) NREC,NVAR
40 FORMAT(/' On record',I4,' , expecting',I3,' variables',
& ' but found a blank line')
GOTO 200

C   Find FIRST COLUMN which does not contain a comma or blank
50 DO 60 I=1,LAST
IFIRST=I
IF(.NOT.(T(I).EQ.' ' .OR. T(I).EQ.',')) GOTO 70
60 CONTINUE

C   COUNT NUMBER OF VARIABLES = NV
70 JFIRST=IFIRST
NV=1
NBLANK=0

DO 110 I=IFIRST,LAST
IF(T(I).EQ.' ' .OR. T(I).EQ.',') GOTO 80
NBLANK=0
GOTO 110

80 NBLANK=NBLANK+1
IF(NBLANK.NE.1) GOTO 100
IVAR(NV)=0
DO 90 J=JFIRST,I-1
READ(T(J),'(I1)') IDIGIT
IVAR(NV)=10*IVAR(NV)+IDIGIT
90 CONTINUE
NV=NV+1
100 JFIRST=I+1
110 CONTINUE

IVAR(NV)=0
DO 130 J=JFIRST,LAST
READ(T(J),'(I1)') IDIGIT
IVAR(NV)=10*IVAR(NV)+IDIGIT
130 CONTINUE

IF(NVAR.EQ.NV) RETURN

```

```
      WRITE(*,150) NREC,NVAR,NV, (T(I),I=1, LAST)
150 FORMAT(/' On record',I4,' expecting',I3,
& ' but found',I3,' variables'/1X,79A1/1X,41A1)

200 IERR=1
    IF (NV.GT.NVAR) RETURN
    DO 210 I=NV+1,NVAR
210 IVAR(I)=0
    RETURN

300 IEND=1
    RETURN
    END
```

Appendix Q. Source code for FORTRAN program CONVRBAS.EXE.

```
$DEBUG
C..... CONVERT INSEASON PRN FILES INTO RBASE COMPATIBLE FORMAT
C..... i.e. GROUND.PRN, WEIR.PRN, & AERIAL.PRN
C..... NO PROVISION MADE FOR FOOTNOTES IN GROUND.PRN
C..... OR BAY FISH IN AERIAL.PRN
C.....
      IMPLICIT DOUBLE PRECISION (A-H)
      IMPLICIT DOUBLE PRECISION (O-Z)
      CHARACTER*32 FNAME
      CHARACTER*20 TEXT, TSAV
      REAL MON(60)
      DIMENSION COUNTL(60,2), COUNTC(60,2)
      DIMENSION DAY(60)
      INTEGER SCODE, CSAV
      INTEGER IDATA(4)
      WRITE(*,1600)
1600 FORMAT(' YEAR ? (e.g. 90)    \'')
      READ(*,1700) IYR
1700 FORMAT(I2)
C.....
C..... note STREAM.PRN SHOULD HAVE 8 LEADING BLANK OR HEADER LINES
C..... SEPARATE STREAMS WITH A BLANK LINE
C.....
      OPEN (1,FILE='GROUND.PRN')
      OPEN (2,FILE='RBASEG.SOU')
      OPEN (3,FILE='RBASEG.OUT')
      OPEN (4,FILE='RBASEG.EAS')
      OPEN (5,FILE='RBASEG.KAM')
C..... 1=PINK, 2=CHUM
      DO 500 ISP=1,2
      IF(ISP.EQ.2) REWIND 1
C..... SKIP FIRST 8 LINES
      DO 80 ISKIP=1,8
      READ(1,2000)
80 CONTINUE
      ISTOP=0
      IPASS=0
C..... DATA1 = LIVE, DATA2 = CARCASS
      95 IF(ISP.EQ.1) READ(1,2000,END=290) TEXT, SCODE, IM, ID, IZ, DATA1, DATA2
2000 FORMAT(A20,I4,2I3,I2,2F7.0,29X,A25)
      IF(ISP.EQ.2) READ(1,2040,END=290) TEXT, SCODE, IM, ID, IZ, DATA1, DATA2
2040 FORMAT(A20,I4,2I3,I2,14X,2F7.0,15X,A25)

      WRITE(*,2050) TEXT, IM, ID, IZ
2050 FORMAT('+',A20,3I4,' file = GROUND.PRN')
C..... SKIP IF NO DATE (BLANK LINE)
      IF(IM.EQ.0.OR.ID.EQ.0) GO TO 95
C..... SKIP IF NEGATIVE COUNTS
      IF(DATA1.LT.0.OR.DATA2.LT.0) GO TO 95

C..... PROCESS ONLY ONE STREAM AT A TIME
      IF(IPASS.EQ.1) GO TO 101
      IPASS=1
97   TSAV=TEXT
      CSAV=SCODE
      IDSAV=(IM*100)+ID
      N=1
      MON(N)=IM
      DAY(N)=ID
      DO 99 IN=1,60
```

```

DO 99 IZN=1,2
COUNTL(IN,IZN)=0
COUNTC(IN,IZN)=0
99 CONTINUE

101 IF(TEXT.EQ.TSAV) GO TO 102
GO TO 300
C.....ASSIGN DAY NUMBERS TO COUNTS
102 IDATE=(IM*100)+ID
IF(IDATE.EQ.IDSAV) GO TO 103
IDSAV=IDATE
N=N+1
MON(N)=IM
DAY(N)=ID
103 COUNTC(N,IZ)=DATA2
COUNTL(N,IZ)=DATA1
GO TO 95

290 ISTOP=1
C.....FIND DAILY TOTAL FOR INTERTIDAL & STREAM FOR BOTH PINK & CHUM

300 DO 370 IN=1,N
C.....RBASE OUTPUT: (IZ) 1 = INTERTIDAL, 2 = STREAM
IFILE=CSAV/1000
IFILE=IFILE+1
IMO=MON(IN)
IDA=DAY(IN)
IDATA(1)=COUNTL(IN,1)
IDATA(2)=COUNTC(IN,1)
IDATA(3)=COUNTL(IN,2)
IDATA(4)=COUNTC(IN,2)
WRITE(IFILE,3200) CSAV,IMO,IDA,IYR,ISP,(IDATA(I),I=1,4)
3200 FORMAT (I4,'.',I2,'/',I2.2,'/',I2,',1,''G'','I1,',0,0,'
&,I10,'.',I10,',0,0,'I10,'.',I10,',0,0')
C.....END DAILY TOTAL
370 CONTINUE
IF(ISTOP.EQ.1) GO TO 500
GO TO 97

500 CONTINUE
go to 800
C.....
C.....note WEIR.PRN HAS NO LEADING BLANK LINES
C
C OPEN (6,FILE='WEIR.PRN')
C OPEN (7,FILE='RBASEW.SOU')
C 600 READ(6,4200,END=610) ICODE,ISPECIE,M,ID,ISL
C4200 FORMAT(I4,I3,I2,I3,I9)
C IF(ISPECIE.EQ.44) ISP=1
C IF(ISPECIE.EQ.45) ISP=2
C WRITE(7,4400) ICODE,M,ID,IYR,ISP,ISL
C4400 FORMAT (I4,'.',I2,'/',I2.2,'/',I2,',1,''W'','I1,',0,0,0,0,0,'
C   &,I10,',0,0,0')
C   GO TO 600
C.....
C.....note AERIAL.PRN SHOULD HAVE 5 LEADING BLANK LINES
C.....do not use back seat observer's counts
C.....
610 OPEN (8,FILE='AERIAL.PRN')
OPEN (9,FILE='RBASEA.SOU')
OPEN (10,FILE='RBASEA.OUT')
OPEN (11,FILE='RBASEA.EAS')

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OPEN (12,FILE='RBASEA.KAM')
DO 620 I=1,5
READ(8,4600)
620 CONTINUE
650 READ(8,4600,END=800) TEXT,ICODE,M,ID,IData(3),IData(1),IData(2)
4600 FORMAT(A20,8X,I4,I2,I3,3I9)
      WRITE(*,4650) TEXT,ICODE,M,ID
4650 FORMAT('+' ,A20,3I4,' file = AERIAL.PRN')
      IF(ICODE.EQ.0) GO TO 650
      IFILE=ICODE/1000
      IFILE=IFILE+8
C.....1=PINK, 2=CHUM, 3=SOCKEYE
      DO 700 IS=1,3
      WRITE(IFILE,4700) ICODE,M,ID,IYR,IS,IData(IS)
4700 FORMAT (I4,' ',I2,'/',I2.2,'/',I2,' ',1,' ''A'' ','I1,
      &',0,0,0,0,0,' ,I10,' ,0,0,0')
700 CONTINUE
      GO TO 650
800 STOP
      END
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